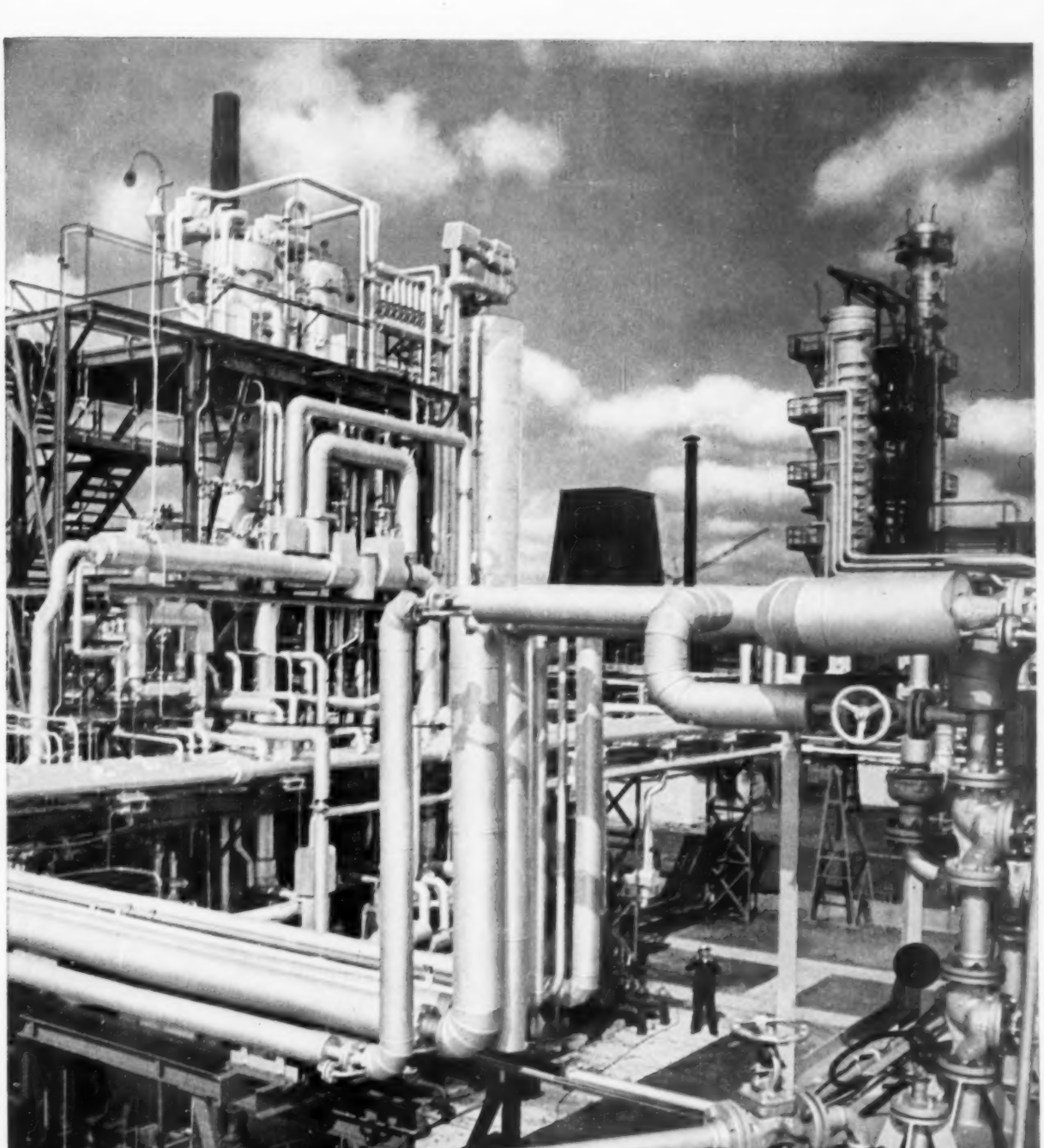
WORLD PETROLEUM

FEBRUARY, 1961



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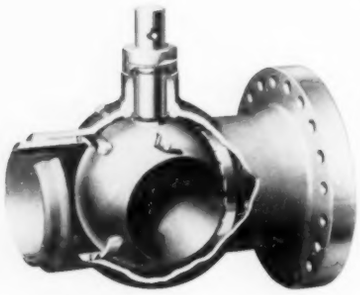

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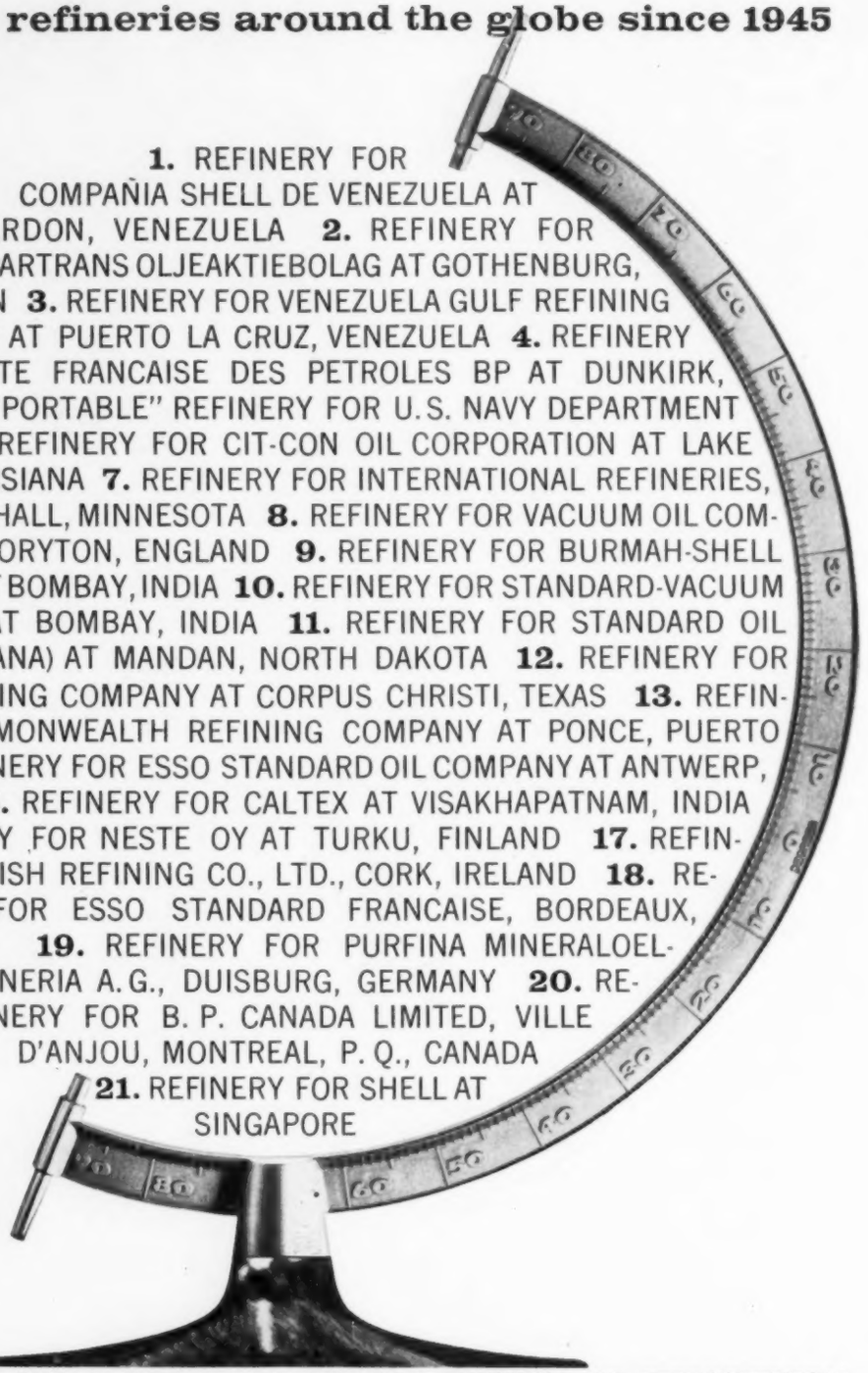

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World Petroleum

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THIS MONTH'S COVER

View of deasphalting unit at Salzbergen, Germany, refinery of Wintershall A.G., reproduced here through courtesy of Wintershall. Read "100 years of refining at Salzbergen" in this issue.

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by Joseph B. Huttlinger

Cut West Coast Imports

U. S. Department of the Interior cut import quotas for historic importers to the West Coast in setting allocations for the first half of 1961.

A year ago, Interior gave historic importers at least 75.5% of their quotas under the voluntary import program. Now, it has cut this to 70%.

Interior also moved to give a break to smaller refiners in setting the sliding scale formula on which imports are parceled out to each refiner.

A year ago, Interior used a scale that allowed a refiner with runs of up to 10,000 b/d 35.4% of his runs in imports. Now, the percentage is 42. At the other end, the year-ago scale allowed plants with 200,000 b/d and more about 7.5% of the runs in imports. The new percentage is 7.6%.

The action is seen as one more step toward eventual wiping out of the floor for historic importers, and putting all importers on the basis of the sliding scale of imports.

Some importers would be content to wipe out the historic floor, if the sliding scale, too, were wiped out, and all refiners given the same percentage of their runs in imports.

The new allocations cover 239,923 b/d of oil under license, against 226,770 b/d actual imports under license in the first half of 1960.

This includes 229,304 b/d of crude and unfinished oils in the first half of 1961; 3,866 b/d of residual oil and 6,753 b/d of other products. Actual imports a year ago were 220,068 b/d of crude and unfinished oils, and 6,702 b/d of products. No residual was imported.

The licensed imports a year ago were swelled by 53,476 b/d of unlicensed crude and unfinished oils from Canada and 444 b/d of unlicensed products from Canada. This made a total of 280,690 b/d of actual imports into District 5.

For the first half of 1961, Interior officials estimate some 40,000 b/d will come from Canada in unlicensed imports, for a total of 279,923 b/d.

Capital Spending Decreases

The U. S. oil industry will cut its spending for new plant and equipment by 10% in the first quarter of 1961 compared with the same period in each of 1960 and 1959, it is shown in a new government survey.

Capital spending in the U. S. by companies in the industry will come to $480 million in the first quarter of 1961, against $530 million in the first quarter of 1960 and $520 million in the first quarter of 1959.

A report from the U. S. Department of Commerce and the Securities and Exchange Commission added that capital spending in all of 1958 came to $2,430 million; in 1959 to $2,490 million and in 1960 to $2,580 million. Usually, the first quarter is the low point of capital spending by oil companies, with a pickup that reaches the peak in the fourth quarter.

1961 Demand Forecasts for U. S.

U. S. demand for gasoline will reach 4,231,000 b/d in the coming year, with a gain of 2.1% from the demand of 4,142,000 b/d in 1960, it is estimated by the U. S. Bureau of Mines.

The first quarter of 1961 will see a gain of 1.5% ahead of the same period a year earlier. The second quarter will gain 2.0%, the third 2.6%, and the fourth 2.3%, it is estimated.

Total domestic demand will reach 9,859,000 b/d, up 1.8% from a year earlier.

Demand for fuel oil is due to climb about 1.4% in 1961 over the year before, it is estimated.

In its annual forecast for the year ahead, the bureau foresaw demand for distillate fuel oil at 1,904,000 b/d for the coming year, against 1,877,000 in 1960. Residual oil demand is due to drop 1.8% to 1,901,000 b/d. The bureau explained that new natural gas pipe lines to the West Coast and import curbs will help bring the cut in residual oil use.

The forecast assumes normal weather, no change in crude oil stocks

Pipeline

and an improvement in general business in the third quarter of the year.

Kerosine use is expected to reach 395,000 b/d, a gain of 8.8%. This reflects increased use of the fuel by jet aircraft.

The distillate forecast, which reflects expected use of heating oil, is as follows:

First quarter		
1960	2,708,000 b/d	
1961	2,730,000 b/d	up 0.8%
Second quarter		
1960	1,380,000 b/d	
1961	1,410,000 b/d	up 2.2%
Third quarter		
1960	1,214,000 b/d	
1961	1,260,000 b/d	up 3.8%
Fourth quarter		
1960	2,209,000 b/d	
1961	2,230,000 b/d	up 1.0%
Year		
1960	1,877,000 b/d	
1961	1,904,000 b/d	up 1.4%

New Alaskan Wildlife Ranges

Secretary of the Interior Fred A. Seaton has set up three new wildlife ranges in Alaska, with a total of 11.2 acres.

Oil and gas leasing and development will be permitted in the areas, but only under stringent regulations of the Fish and Wildlife Service, Seaton said.

Mr. Seaton, who took the action near the close of his term in office, explained he was acting to preserve "the priceless resource values" of the areas.

Interior Secretary Seaton also announced signing a notice that will make it possible for the Bureau of Land Management to resume issuing noncompetitive oil and gas leases.

Leasing had been temporarily suspended since September 2 pending completion of new regulations resulting from changes in the Mineral Leasing Act passed in the last session of Congress.

The notice will permit the Bureau of Land Management to resume issuing leases provided the lease applicants agree to abide by the new rental rates and other revisions of the regulations as are necessary to comply with the new law (Public Law 86-705).

The notice specifies that the new rental for noncompetitive oil and gas leases will be 50 cents an acre per year for the 10-year term of a lease. The rental rate for lands in a producing oil and gas field will be $2 an acre per year. The new rates will not affect leases issued and outstanding before September 2, 1960.

BLM Director Edward Woozley said that since leasing has been suspended a substantial backlog of pending oil and gas lease offers has developed in BLM's Land Offices. BLM will do everything possible to expedite issuance of these leases as soon as it is possible to resume leasing.

All applicants for oil and gas leases pending since September 2 will be given an opportunity to consent to the new rates and regulations, so that BLM may go ahead and take final action on the lease offers.

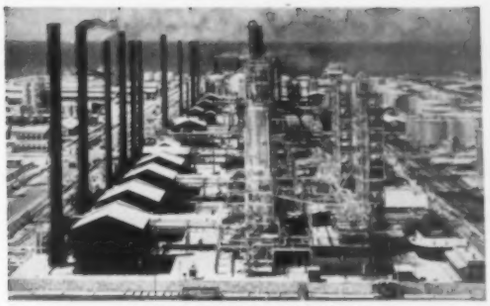
The complete text of the notice is to be published in the **Federal Register.**

Controls Will Be Stricter

U. S. producers of crude oil and natural gas seem to face stricter, not looser, controls over their sales of natural gas.

And the industry may be in for a full scale national fuels policy which would curb gas and to a lesser extent oil, to preserve markets for coal.

(Continued on page 74)



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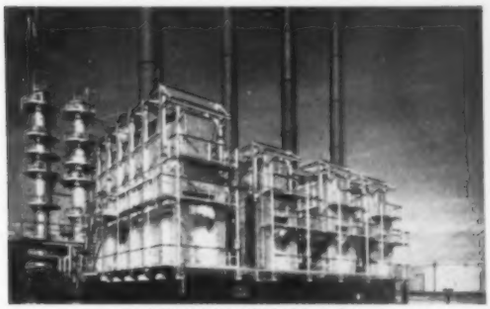

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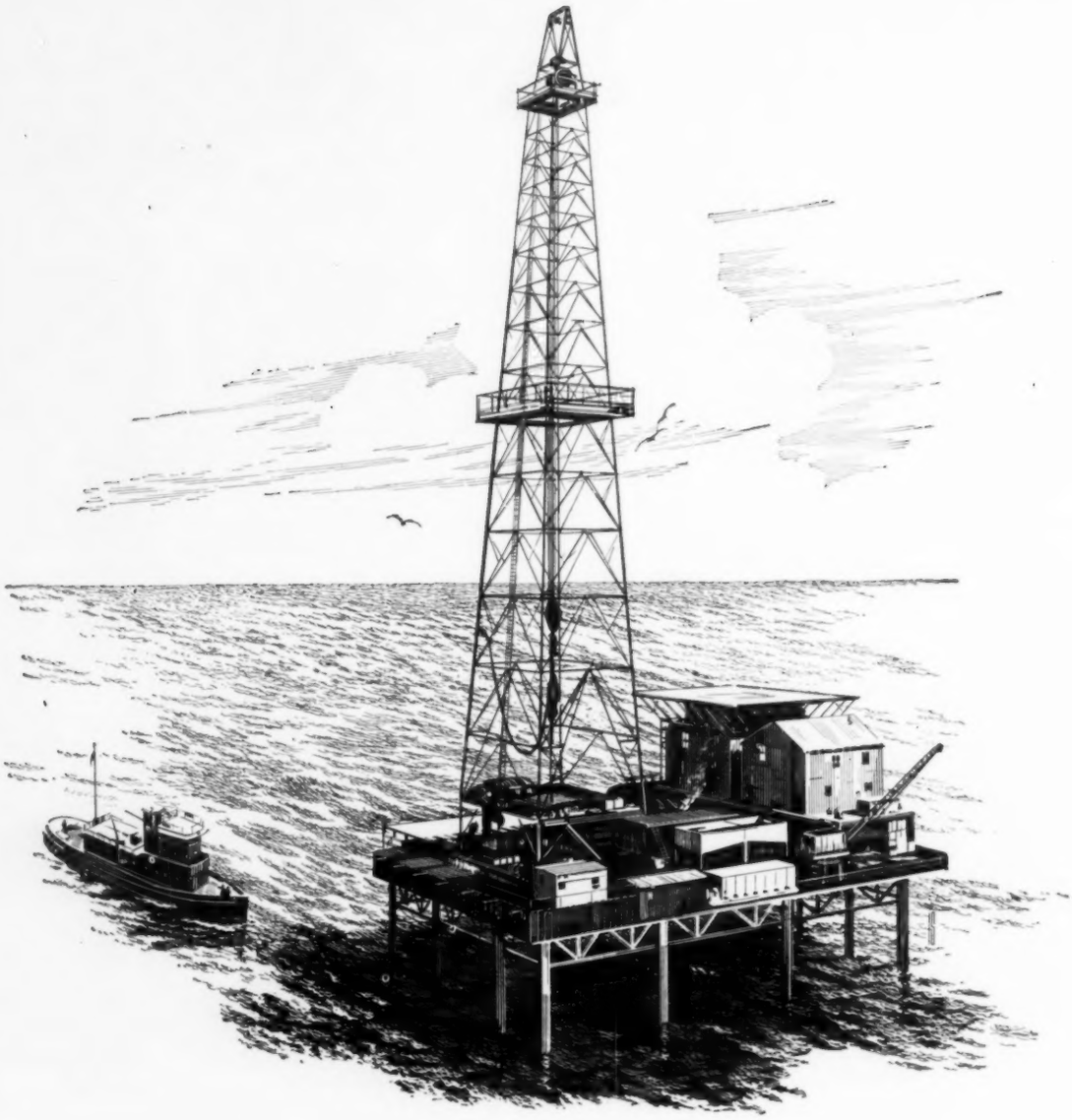

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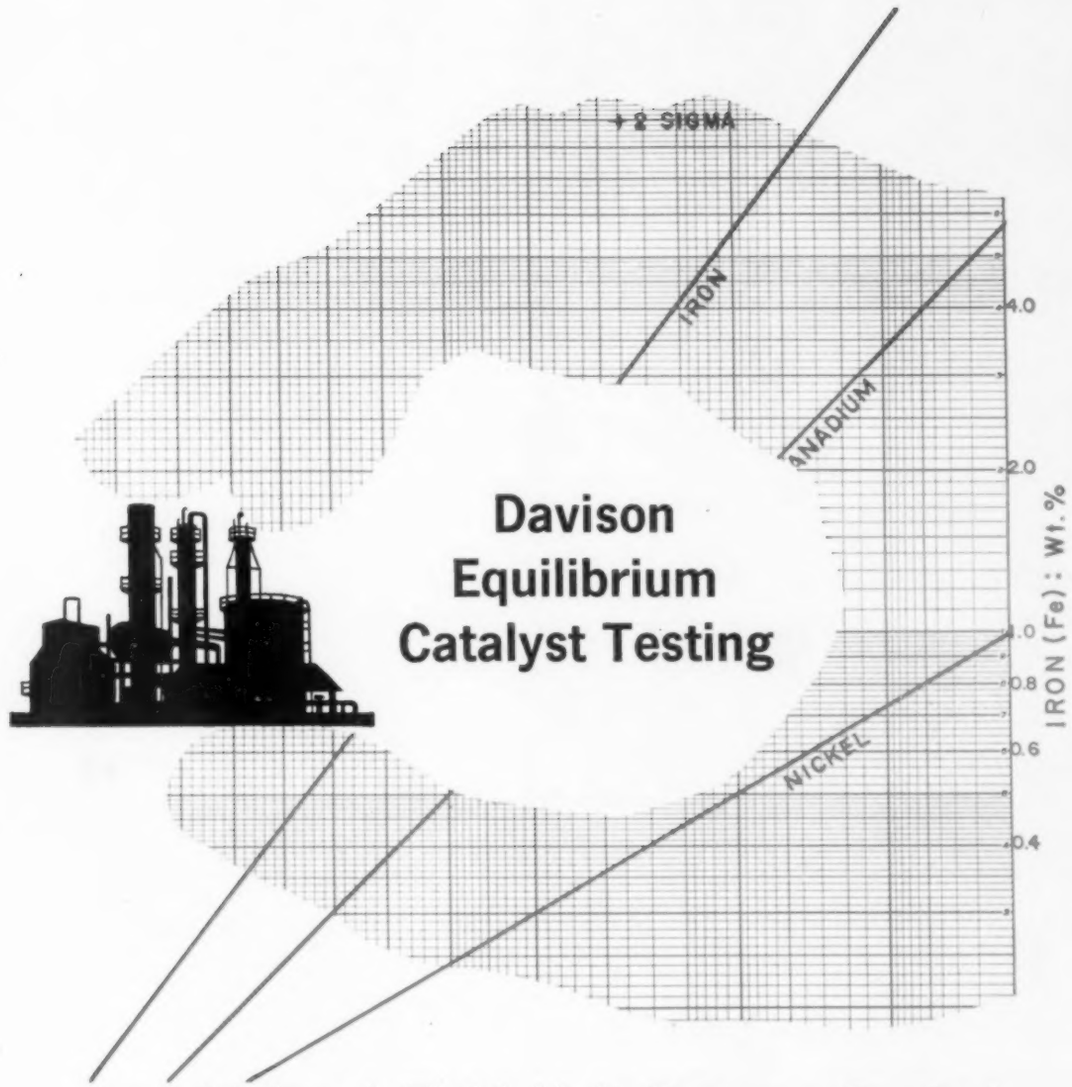

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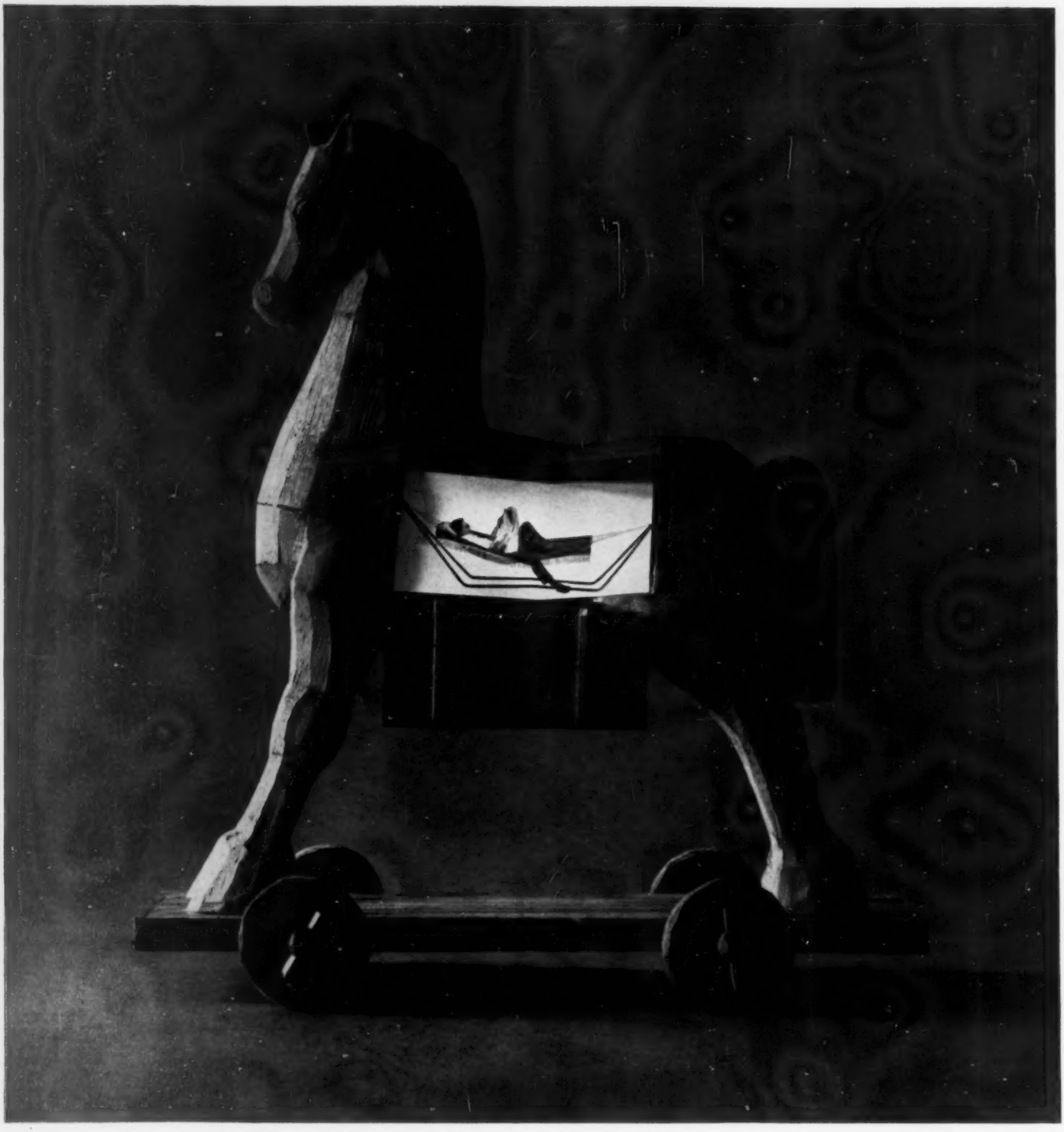

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— Leo D. Welch, Chairman of the Board

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Fuel Oil Consumption Rises 27%

Deliveries of petroleum products into UK consumption (excluding bunkers for ships engaged in the foreign trade) totalled 230,803,000 barrels (842,350 b/d) in the first nine months of 1960, a rise of 33,549,000 bbls (17%) over the corresponding 1959 total of 197,254,000 bbls (722,540 b/d).

The predominant feature continues to be the black oils. The totals for fuel oil alone (excluding refinery consumption) in these periods were 82,533,000 and 64,917,000 bbls respectively, a rise of 17,616,000 bbls (27.1%). Gas oil, diesel oil (excluding derv), and fuel oil (excluding refinery consumption) together accounted for 101,231,000 bbls, against 81,545,000 in the 1959 period—a rise of 19,686,000 (24.1%).

The information independently collated for the UK Petroleum Industry Advisory Committee and available from Petroleum Information Bureau can be summarized thus (in thousands of barrels):

UK Deliveries into Consumption

	1960	1959	Difference Percent
	(January to September)		
Aviation fuels	12,013	10,970	+ 9.5
Motor spirits[a]	50,289	46,800	+ 7.5
Industrial[b] and white spirits	2,497	2,320	+ 7.6
Kerosene	8,685	8,800	— 1.3
Lubrication oil and grease	4,994	4,695	+ 6.4
Diesel engine road fuel	14,105	12,377	+14.0
Gas/diesel oils	18,698	16,628	+12.4
Fuel oil[c]	99,113	80,068	+23.8
Miscellaneous	20,409	14,596	+39.8
Total	230,803	197,254	+17.0

Notes: [a]Includes motor benzole. [b]Includes industrial benzole. [c]Includes refinery consumption: 1960—16,580,000; 1959—15,151,000.

There has been a continually growing preference for premium grade gasoline, which now accounts for two-thirds of total demand. Under kerosene, the burning oil rose 6.4% to 6,716,000 bbls, whereas vaporizing oil further declined 20.8% to 1,969,000 bbls owing to the continued changeover of agricultural tractors to diesel units. Under "miscellaneous," the "other products"—mainly chemical feed-stock and products supplied to the gas industry—rose no less than 60.7%, to 13,612,000 from 8,469,000 bbls.

AGIP in the UK

It has now become clear that the private company, Agency for General Import of Petroleum Ltd., registered August 23, 1960, with a nominal capital of £100 in £1 ordinary shares, represents the Italian AGIP group's formal entry into the UK petroleum industry. Its articles of association cover every form of industry activity.

One of the directors now recorded is Dr. Pierangelo Formentini, head of the foreign department of ENI, of which AGIP is the marketing organization. The other two directors named so far are British; Domenico Rolandini, bank official, and A. J. Gibson-Watt, a director of Hambros Bank (Nominees) Ltd., Elliott-Automation Ltd., and other companies. Mr. Gibson-Watt is also shown as secretary of the new company. Hambros Bank (Nominees) is recorded as holding 98 of the 100 issued £1 shares.

In recent months the company has been conducting an active survey of the prospects for entering UK oil distribution, both on the wholesale and retail sides.

Crankcase Lubricant Symposium

An international symposium on engine testing of crankcase lubricating oils, being organized by the Institute of Petroleum's engine tests of lubricants panel, will be held at the Hotel Metropole, Brighton, May 17 to 19, 1961. Delegates are expected from the US Services and papers are expected from the Coordinating Research Council of the Cooperative Fuel Research Organization.

The work of the IP panel and other national bodies in this field will be described; engine manufacturers will state their views on test methods for performance determination; and government and other bodies their views on evaluation and gspecifications of such lubricants. The aim of the meeting is to decide on action to secure better coordination of all efforts.

Details of the symposium can be obtained from the IP at 61 New Cavendish Street, London, W.1.

Revival in Equipment Orders

The revival in the value of orders for materials and equipment (excluding tankers) placed in the UK by British-based oil companies continues. Figures published by the Council of British Manufacturers of Petroleum Equipment on behalf of the Oil Companies Materials Secretariat show a total of £90,307,385 for the first nine months of 1960, a rise of £7,127,700 (8.6%) over the same period of 1959. That year's total of £117.3 million seems certain to be well exceeded.

Once again bulk chemicals, catalysts, etc., is the largest category at £20.5 million *(against £16.9 million in the 1959 period)*, other leading groups being (in £ million): tubulars, pipe fittings and valves, £8.3 *(£8.8)*; automotive equipment, £6.7 *(£7.7)*; specialized drilling and production equipment, £6.5 *(£7.9)*; and commissary and office requisites, etc., £6.4 *(£5.2)*. Specialized refinery equipment, at £4.9 million, shows a good recovery from the corresponding 1959 total of £2.4 million.

Petroleum Information Bureau reports that nearly 60% of the total was in respect of orders for use overseas and comments on the very substantial orders from companies not based in Britain and from countries such as Mexico where the industry is state-owned and thus are excluded from the OCMS figures. The CBMPE chairman was estimated that they may add up to 25% of the value of orders received from British-based oil companies.

Curb on Oil Turned Down

The Minister of Power has turned down the plea from the National Union of Miners for a further check to be made on the use of oil for heating as he does not believe the coal industry will have to face the crisis that is suggested. The union, in its demand for a national fuel policy and, inter alia, a limitation on fuel oil imports, asserted that "if the present over-rapid growth in oil consumption is not checked, the country will face an insufferable burden in its balance of payments and a further rapid contraction in the coal industry."

In his reply, the minister said: "I cannot see that the costs and inconveniences of restricting the growth of oil consumption would be justified by any realistic assessment of the coal industry's prospects."

On the use of fuel at power stations, he pointed out that the conversion-to-oil program had been cut to nearly a half and the government is not prepared to press the electricity authorities to go further at the cost of setting contracts aside. If the gas industry submitted a program for the use of imported methane on a commercial scale, he promised that the possible effects on the coal industry would be assessed carefully.

Castrol Industrial Ltd.

The name of Wakefield-Dick Industrial Oils Ltd. has been changed to Castrol Industrial Ltd. as part of the group's policy to trade under the one name—Castrol—throughout the world.

British Burmah Capital Repayment

The British Burmah Petroleum Co. is repaying 1s 6d on each of its 3.75 million 3s shares. This capital repayment will come for the most part from redemption by British Burmah Petroleum Co. (South Africa) of about a third of its outstanding unsecured loan stock.

Refining Capital Expenditure Falls

Capital investment in UK oil refining fell 45.3% in the year 1959, the largest decline of any industrial group in the country. The total was £21.7 million, compared with £39.7 million in 1958 and £42.2 million in 1957. These totals cover expenditure on acquisitions of new and secondhand plant, machinery and vehicles, and new building work (excluding site value). Expenditure by subsidiaries mainly operated abroad.

US Agreement on Oil Pollution

The most disappointing thing has been the slowness with which the international agreement had come into effect, said Lord Chesham, parliamentary secretary to the Ministry of Transport, replying to a debate on marine oil pollution in the House of Lords in December. He regretted that many parts of the world not so seriously affected as Europe did not regard the problem as serious enough to accept the international convention which came into effect in 1958.

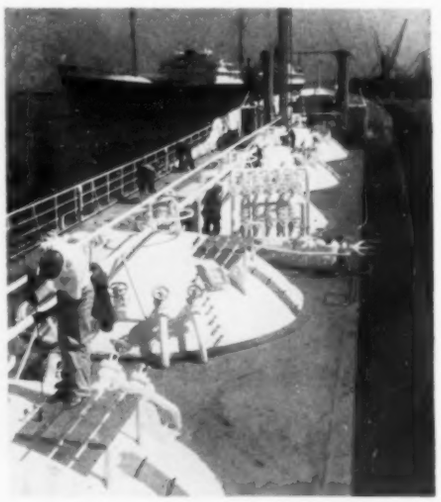
It applied even now to only 12 countries of the 32 represented at that conference. Earlier last year the US senate committee on foreign relations had endorsed a proposal by President Eisenhower that the convention should be ratified, even though the US did not regard it as entirely satisfactory. He understood the necessary legislation was now being prepared. "I hope," he added, "that this will not be overlooked because of recent happenings in the United States."

The government had recently learned that Australia and Italy hoped to ratify the convention soon, and he earnestly hoped others would follow. The pollution problem, he believed, was improving, but the only real hope lay in international agreement.

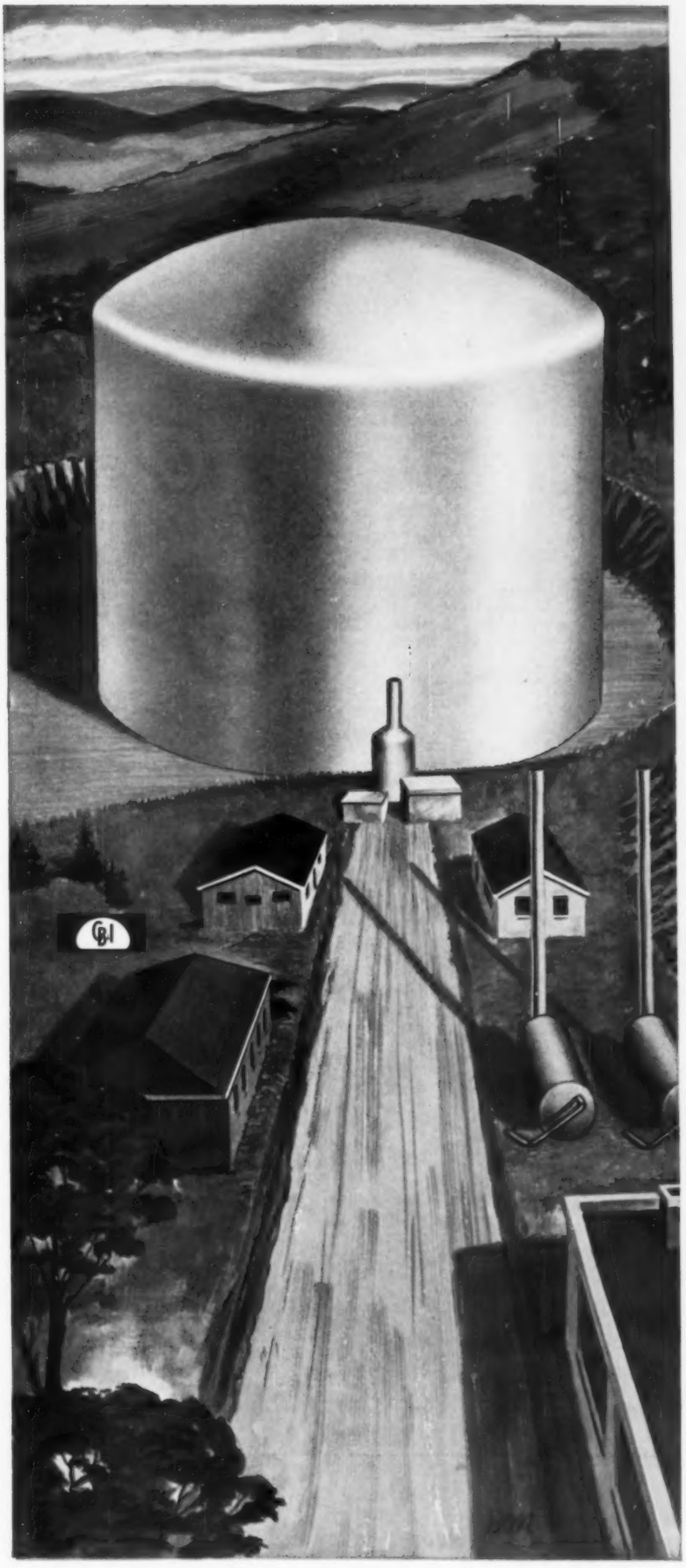
ICI in Russian Deal

S. P. Chambers, CB, chairman of Imperial Chemical Industries, and representatives of the company were in Moscow in December negotiating for the sale of plant for producing ICI's polythene in Russia. Negotiations were also expected for the purchase of a Soviet process license for the production of caprolactum, raw material for a special grade of nylon. Mr. Chambers was reported as believing the Soviet process was better and cheaper than the one ICI had proposed to adopt. Representatives of Simon-Carves, who would erect the polythene plant in cooperation with ICI were also present in Moscow.

(Continued on page 12)



Imperial Chemical Industries' Heavy Organic Chemicals Division has done much pioneer work in the bulk transportation of its products. Here is a special purpose tanker, the "MT SIGNE THOLSTRUP," owned by A/S Kosangas of Copenhagen, leaving Teesport with a cargo of butadiene in special storage spheres.



Unique Refrigerated PROPANE Storage System

WILL REDUCE COSTS OF DOUBLING PEAK SHAVING CAPACITY

A 120,000 bbl. propane storage tank will be the heart of a refrigerated facility for liquefied gas under construction at Minneapolis Gas Company.

The facility employs a unique approach in self refrigeration. Purging and control problems are reduced by condensation of vapors at less than ambient temperatures.

The double wall steel tank stores 120,000 bbls. at −50°F, the equivalent of 137,500 bbls. at +60°F. The outer tank will be 106 feet in diameter and 100 feet high.

Storing propane as a liquid for peak shaving is less costly than contracting for additional natural gas. The initial cost of conventional above-ground pressure storage would be about 3 times the cost of this refrigerated facility.

Fully refrigerated storage was selected for the new facility for (1) economy, (2) ease of expansion and (3) the ability to locate the facilities exactly where they would do the most good.

CB&I has complete responsibility for design, fabrication, erection and start up of the refrigeration plant and storage facility.

Write for our Brochure G-48, "Refrigerated Storage Facilities."

Another achievement in low-temperature storage

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Regent Oil Modernization

Another stage in Regent Oil Co.'s modernization and expansion program of storage and distribution facilities was reached in December with the opening of a new fuel oil terminal on a 12-acre site at Queen Alexander Docks, Cardiff. This will fulfil the dual function of providing ocean storage and bunkering facilities in South Wales for fuel oils and of replacing the Penarth light oil depot by a larger one with improved facilities.

Two views of Regent Oil Company's new terminal at Cardiff.

Incoming cargoes are discharged by three 8-in. "EMCO" marine unloading arms manifolded into 12 and 10-in. docklines, and six tanks provided storage for 180,000 bbls of three grades of fuel oil. Six 600 gpm positive displacement pumps are provided for delivery to road and rail tank cars simultaneously. Twenty 20-ton rail tank cars can be handled at once. The separate light oil depot has storage for some 45,000 bbl of gasolines, kerosine and gas oil, and is equipped with four 500 gpm and six 250 gpm pumps supplied by Precision Electrical Products (Stockport) Ltd. Constructors John Brown Ltd. designed and built the terminal, and Whessoe the tanks; piping was supplied by Stewarts & Lloyds and tank heaters by Brown Fintube.

"Total" Gasoline Stations

Total Oil Product Ltd., UK subsidiary of Cie. Francaise des Petroles, has entered the UK retail gasoline trade by opening its first company-owned station just outside London. Two more, in southern England, were expected to be opened in December and these are expected to be followed in the near future by three in the Manchester area.

Special "servicing while you wait" will be a feature of these stations, including free vacuum cleaning the interior of regular customers' cars and balancing of front and rear tire pressures with a device that does it simultaneously.

Esso Pipeline Bill and Policy

Esso Petroleum Co.'s pipeline bill which seeks parliamentary approval to lay two lines, each some 75 miles long, from Fawley to west London and ICC's new petrochemical works at Severnside (Gloucestershire) respectively, has been given an unopposed second reading in the House of Lords, having already passed the House of Commons. Esso expects to be in a position to start construction in February or March.

This will be the last such measure under the present private bill procedure as the government has decided this is not the best method, and this feeling has recently been reinforced by the knowledge that other pipeline projects are planned, though not all have yet been submitted for official approval. All public aspects of policy and procedure for the general coordination of future UK pipeline development, and the lines of any new legislation required, are now under consideration and a statement is promised by the Minister of Power in the near future.

New Esso Terminal

A new terminal at Tynemouth in Durham with a capacity of 25 million gallons of gas, diesel and fuel oils and costing £1.5 million has been brought into operation by Esso Petroleum Co. Automatic equipment for measuring tank contents and temperatures is incorporated. A 2-berth jetty has been built, one for coastal tankers and the other for vessels up to 26,000 dwt, which involved moving 500 yards of the Northumberland Dock wall. The contractors for the project were Christiani & Nielsen Ltd., Harbor & General Works Ltd., and William Press Ltd. Plans were well advanced in December to increase the number of tanks from nine to 32 at a further cost of £750,000 to enable the terminal to handle gasolines, kerosines and farm fuels in 1962.

New Publications

"PIB Memos"—New or revised memorandum now available from Petroleum Information Bureau (29 New Bond Street, London, W.I.) include: Growth of world oil production (with chart of changes by main areas and countries each five years since 1920); Middle East oil concessions; Oil in Africa (with map); Oil in Britain (with map); Oil in the Far East (with 2 maps); Oil in Latin America (with 8 maps); Oilfields of the Commonwealth (with 10 maps); World oil refining capacity, end-1959; and World oil reserves (with chart of growth since 1930). Text matter of these memos is condensed but informative and maps are commendably clear.

"Planning for Productivity in the Oil Industry"—The six papers presented at the 1960 summer meeting of the Institute of Petroleum and the discussions on them are recorded in this 160-page publication. These are: (1 Philosophy and techniques—Dr. T. U. Matthew, T. I. (Group Services) Ltd.; (2) Role of operational research—G. W. Sears, Shell International Petroleum; (3) Modern methods of reservoir assessment and control—J. L. Hopkinson, Iraq Petroleum; (4) Application of the computer to refinery programming—W. J. Newby and R. J. Deam, British Petroleum; (5) Modern laboratory control of product quality—S. A. Berridge, A. J. Castle and A. J. Morris, Esso Petroleum; and (6) Modern distillation control—T. W. Mathias, Shell-Mex and B. P.

Copies available from the IP, 61 New Cavendish Street, London, W.1., price 35s. (30s. to members).

US Equipment Links

Alco Products Inc., New York, and Davey, Paxman & Co. Ltd., Colchester, England, have agreed to collaborate on diesel engine design, manufacture and sale for world markets. Paxman acquires the right to make and sell Alco-designed diesels in their traditional world markets, as covered by the Ruston Paxman sales organization and, correspondingly, Alco will have the right to sell and make Paxman engines of the Ventura and other types in the US for all purposes, including applications in American equipment for export and in locomotives of sizes other than now manufactured by Alco.

Zwicky Ltd., of Slough, and the Viking Pump Co., of Cedar Falls, Iowa, have concluded an agreement providing for the former to acquire exclusive rights to manufacture and sell the full range of Viking pumps in the UK.

Dracone Flexible Barge Sales

Dracone Operations Ltd. has received orders worth about £70,000 for its flexible barges since its formation last February to exploit them commercially. Orders have come for their use in Nigeria, Borneo, Malaya, Canada and Japan.

A 370-ton unit has now been added to the 35 and 100-ton types already made and a shipping company has recently ordered a special 450-ton Dracone for use in carrying water to certain Greek islands in the Aegean which are now almost arid and which are being developed for tourism.

US Official Optimistic on Oil

The toast of "The Oil Industries Club" at its 24th annual dinner—a gathering of some 1,250 members and guests presided over by H. W. Rocke (Mobil Oil)—was proposed by Wilson T. M. Beale, Minister for Economic Affairs at the American Embassy. The other guest of honor was Julian M. Leonard, president of the Institute of Petroleum.

In his line of business, said Mr. Beale, he was only called in when there were problems in the oil industry and he had been impressed by one important feature—that each time he returned to the subject the situation was completely different. He gathered the industry was now back on familiar ground and was worrying about a world surplus. Personally, he preferred to look on the cheerful side of the picture. What other industry could point to an average annual increase of over 7% in world consumption over the past decade, he asked. And the experts, he understood, forecast an increase of 6 to 7% over the next several years. What the industry had in mind for drilling and for gas stations on Mars he did not know, but he did know he was optimistic about the future of the oil industry.

"I have no doubt in which direction the industry is going," he said. "I do not agree with those who regard the present situation as indicative of a permanent malaise. I think they are wrong when they assume that the industry's transient difficulties forecast a fundamental change in direction."

Appointments

J. M. STOREY, CBE, this year's chairman of the Council of British Manufacturers of Petroleum Equipment, resigned the managing directorship of Dewrance & Co. at the end of the year.

J. R. PAYNE and **N. SHARPLES** have been appointed directors of Cleveland Petroleum Co.

P. A. MEDCRAFT has been appointed general manager of BP Tanker Co. He has held the position of assistant general manager, technical coordination, since February 1958.

P. A. Medcraft

D. G. L. Bean

D. G. L. BEAN has been appointed general manager of British Petroleum Co.'s supply and development department. Since July 1956 he has been with BP Tanker Co. as deputy general manager and, later, general manager.

JOHN C. GARRELS, Jr., of Springfield, Mass., has been elected a director of Monsanto Chemicals Ltd. and appointed deputy managing director. He has now established residence in London. Mr. Garrels joined Monsanto in 1942 and since 1958 has been assistant general manager of its plastics division.

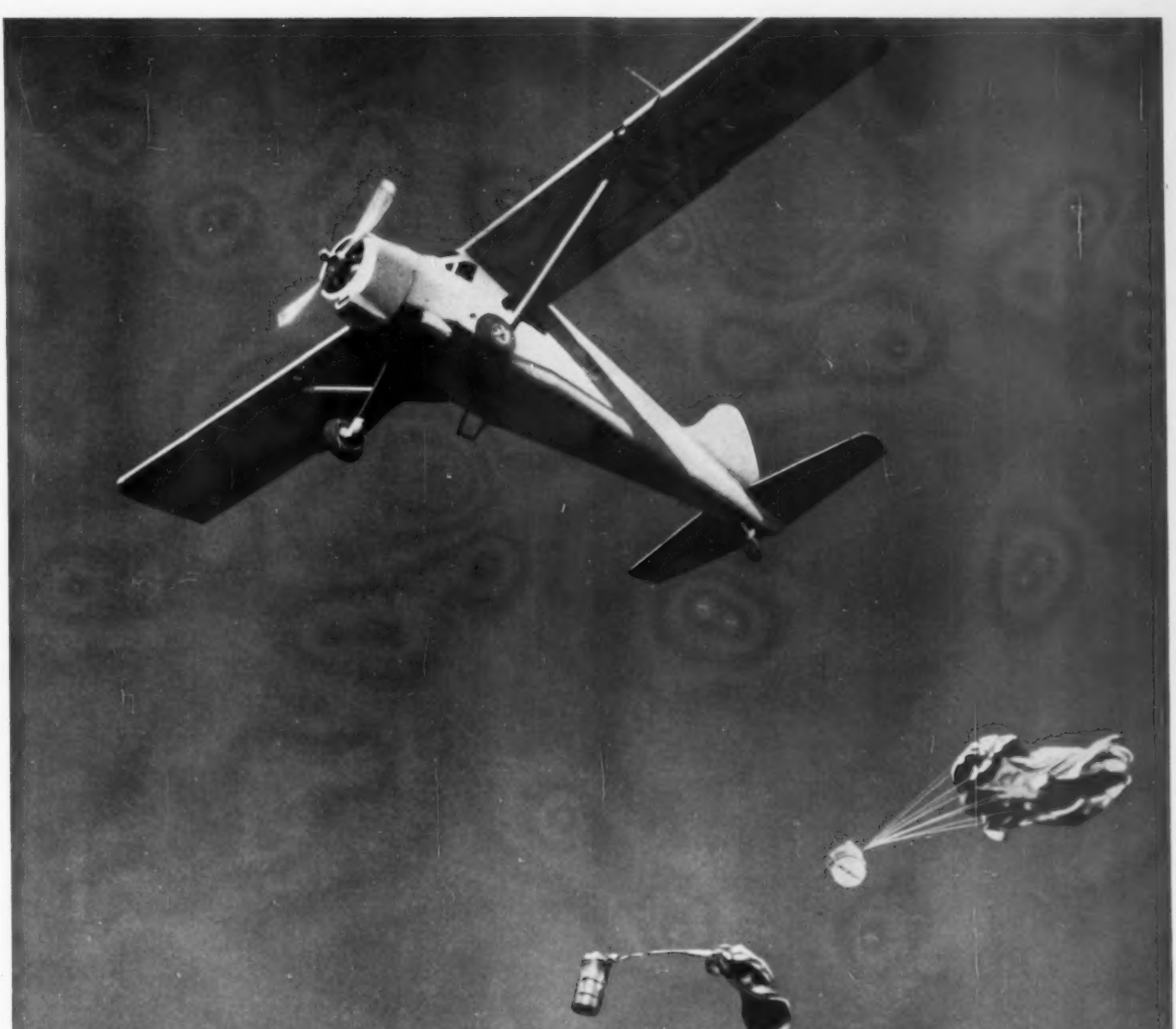
R. D. M. PATTINSON, head of Shell Tankers' tonnage employment-economics division, has been made a director, taking the place of **A. J. RYCROFT**, who has retired.

LORD ROBBINS has been appointed an "ex officio" government director of British Petroleum Co. in place of the late Lord Weeks. For over 30 years he has held the university chair of economics at the London School of Economics and was recently elected chairman of The Financial Times.

C. E. EVANS, OBE, previously general manager of British Hydrocarbon Chemicals Ltd., has been made managing director, and **M. A. L. BANKS** (director, British Petroleum Co.), **A. F. McDONALD** (director, Distillers Co.) and **R. B. SOUTHALL**, CBE, (director and general manager of BP Refinery (Llandarcy, Ltd.) have been appointed directors.

A. L. KING, MBE, Shell-Mex and B. P. general manager-sales since 1957, has been made general manager-operations, succeeding **T. W. MATHIAS**, OBE, who has retired but is taking up other duties with the company. **A. C. DURIE** has been appointed general manager-industrial sales, replacing **H. CUNLIFFE**, who has been general manager-industrial fuels since 1955 and who has retired. Other SMBP appointments are **H. E. BARRY**, OBE, as general manager-administration and **F. W. J. SCOTT**, MBE as general manager-retail sales.

(Continued on page 16)



Airlift Australia

AUSTRALIA'S Snowy Mountains Scheme has presented some unusual challenges to BP as sole supplier of petroleum products. Some of these challenges have been met in unusual ways, such as fuel drops from aircraft.

This gigantic project, midway between Sydney and Melbourne, with its great dams, power stations, and miles of tunnels and aqueducts, is designed both to provide hydro-electricity and to divert irrigation water westwards into the parched plains.

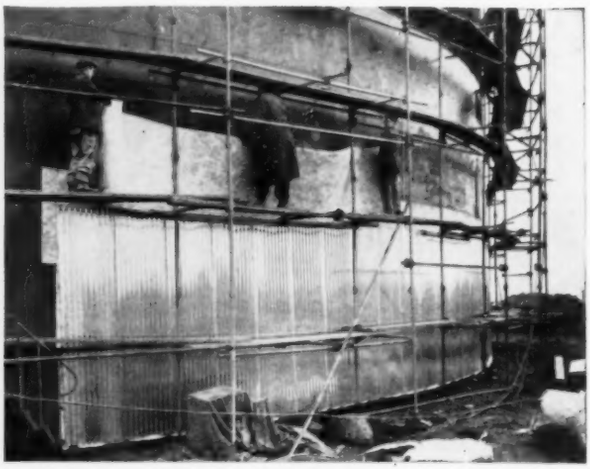
British Petroleum is proud to be associated with the Snowy Mountains Scheme, one of the world's greatest engineering undertakings.

BRITISH PETROLEUM

BP

If you want the benefit of ESSO's experience of insulating tanks . . .

LOOK AT THESE TWO PICTURES



They show the method of applying Crown insulation used on the tanks in the new Esso installation at Tynemouth.

First Stud-weld a series of pins to the surface of the tank.

Second Impale Fibreglass Crown insulation on these pins. Because of its high tear strength it will be supported by the pins indefinitely and without sagging.

Third Cover with light-gauge corrugated sheet metal impaled on the same pins and secured by caps crimped over the prepared ends of the pins.

This method is not only effective and good looking but inexpensive. It does away with the separate framing otherwise necessary, and holds the insulation securely to the tank itself. You can learn more about the advantages from . . . .

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TRADE MARK

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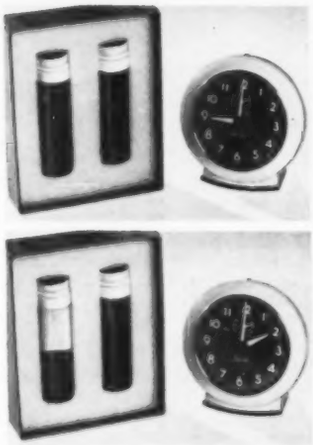
SLUDGE PROBLEMS CONTROLLED!

With Du Pont MHFA-1, the entire fuel system is kept clean

Less than one quart of Du Pont Marine Heavy Fuel Additive No. 1 will ordinarily keep 1,000 gallons of fuel free of sludge problems. Yet this amount assures ship operators of reduced operating and maintenance costs because Du Pont MHFA-1 will normally clean fuel systems of accumulated sludge while in use and keep them clean during operation. As an initial dosage, higher quantities of MHFA-1 are recommended to provide the dissolving and dispersing power you may need.

TYPICAL RESULTS. Du Pont MHFA-1 contains a powerful organic sludge dispersant. Operators find nozzle deposits and strainer deposits are reduced. Most find fuel filters stay cleaner . . . longer. These and many similar reports are common results with Du Pont MHFA-1.

For full details about Du Pont MHFA-1, and the name of your nearest distributor, write: E. I. du Pont de Nemours & Co. (Inc.), Petroleum Chemicals Division, Wilmington 98, Delaware, U. S. A.



In 5 hours, untreated fuel oil sample (at left in both pictures) shows significant sludge separation. But same fuel, with MHFA-1 added, remains evenly dispersed.

AVAILABLE AROUND THE WORLD

MHFA-1 is available to you through a round-the-world distribution network, with service in:

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BELGIUM	HONG KONG
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COLOMBIA	NORWAY
CURACAO	PERU
DENMARK	PHILIPPINES
ENGLAND	SOUTH AFRICA
FRANCE	SWEDEN
GERMANY	UNITED STATES
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CANADIAN NOTES

Tax Incentives

A plea for tax concessions in favor of primary phases of the Canadian petroleum industry has been made by the Canadian Petroleum Association. The formal submission to Prime Minister John Diefenbaker has asked for an amendment to the Income Tax Act to permit deduction from taxable income of 25% of expenses incurred by Canadians, either individuals or companies, in exploration for and development of oil and gas fields.

The submission contended that the effect of present tax provisions is to reduce the incentive for Canadians to explore for and develop reserves, since further expenditures have the effect of reducing the depletion allowed.

It was suggested that incentive is needed to increase Canadian participation in oil and gas development, thereby improving Canada's balance of international trade. The submission argued that no other country in the world has even developed its natural resources so quickly and on such a vastly expanding scale as Canada during a period when tax rates were so high.

The objectives which the C. P. A. hopes will be achieved if the tax request is granted are: a broad participation by Canadians in the search for and development of new oil and gas fields; a broad Canadian ownership of oil and gas resources; reduction of the disadvantages encountered by Canadian operators competing with United States corporations and individuals, which have a more favorable tax position, in the Canadian oil and gas industry.

Gas Sales Up 21%

Natural gas sales in Canada for 1960 were up 21% over 1959 to a gross value of $220,000,000. Utilities had 1,150,000 customers on service lines at end of year, up 85,000 from end of 1959. Exports in 1962 are forecast to exceed 1,000,000,000 cu ft per day, valued at $100,000,000 for the year. Total capital investment now is $1.4 billion, said R. C. McPherson, president of Canadian Gas Association.

Oil Exports Widen

New export market for 5,000 b/d of Canadian crude oil was opened in January by Sohio Petroleum Co. at its Toledo refinery. This was third new export outlet since November. Total Canadian exports in first quarter 1961 are estimated to average 117,000 b/d, down only 4,000 b/d from same period 1960.

11,000 B/D Condensate Deal

Negotiations are reported under way for acceptance of up to 11,000 b/d of condensate by Shell Oil Co. refinery at Anacortes, Wash. Product would come from Canadian wet gas fields, by Trans Mountain pipe line. Shell is currently taking less than 3,000 b/d of Canadian crude at Anacortes.

Trans-Canada Loops Halted

Trans-Canada Pipe Lines Ltd. will not loop any line in 1961, according to present plans. Entire expansion program will be by additional compressor units, using new gas turbine driven engines which have proved highly economical and efficient in 1960 installation. Details of program are not settled.

New Sun Refining Unit

Sun Oil Co. will build a hydrodesulfurizer unit at its Sarnia refinery at cost of $750,000. Completion is scheduled for spring of 1961. Catalytic Construction of Canada Ltd. is contractor. Capacity is 2,700 b/d. It is designed for upgrading of branded heating oils.

Oil Production

Canadian crude oil production for 1960 is estimated at 534,000 b/d, including natural gasoline and condensate. This will be up four percent over 1959 average of 512,000 b/d. Alberta will be 367,000 against 361,000 b/d, but Saskatchewan will show much better gain at 143,000 against 130,000 b/d.

Canada's Oil Use To Rise

U. S. consumption of petroleum products and of natural gas will more than double in the next 20 years, but Canadian use will rise faster, it is estimated by the Canadian-American committee of the National Planning Association. And, Canadian oil exports to the U. S. will increase "tremendously" and Canadian gas will show an even larger increase, the study adds.

Petroleum consumption by the U. S. will rise by 145% from 2,917 million barrels in 1955 to 1957 to 7,140 million barrels by 1980, it is estimated. U. S. natural gas use will rise by 188% from 9,686 billion cubic feet to 27,864 billion.

Canadian oil consumption will rise, it is estimated, by 182%, from 255 million barrels to 717 million barrels. Canadian natural gas use will climb by 970% from 187 billion cubic feet to 2,000 billion. Natural gas liquids use also will rise by 168% in the U. S. to 962 million barrels by 1980, and by a thumping 2100% in Canada to 55 million barrels.

The study was prepared by Wilbert G. Fritz of the U. S. Office of Civil and Defense Mobilization, and published as an association document. The title is "The Future of Industrial Raw Materials in North America."

Crude Imports Rise

Crude imports in the last quarter of 1960 are forecast at 399,078 b/d—up 77,078 b/d from the 322,000 b/d in 1959. Of this amount, 37,000 b/d is excess above receipts by Irving refinery which directly displaces former product imports. Producers believe most of the excess is being refined in Montreal for shipment as products to Ontario. Ontario crude receipts are forecast to drop 31,000 b/d in the last 1960 quarter.

Canadian LP-Gas

Possible objection to sudden intrusion of Canadian gas liquids into USA markets was implied in a speech by oil-imports administrator L. J. O'Connor. He told the IPAA meeting in Dallas that 25,000 b/d to 75,000 b/d proposed by Alberta operators might be considered as "not within the spirit of the Canadian exemption" from normal import controls on crude oil.

Pipe-Mill Activity Down

Available business for western Canada's many pipe mills is believed to be far below capacity in foreseeable future. Ability of foreign mills to compete is large factor in all areas. Some domestic mills will probably operate below break-even point for a long time.

Manitoba Interest Revives

Revival of interest in Manitoba was shown by staking of two rank wildcats in last week of October, with a third to follow shortly. Production in Daly field is on upturn again, due to use of Abrasijet and Sandfrac treatments to stimulate aging wells. Extension of water-flood project to additional area is also being planned.

Canada's Deepest Well

The deepest well ever drilled in the search for oil and gas in Canada has been completed by Canada's largest drilling contractor, Commonwealth Drilling Co. Ltd. of Calgary, working for the California Standard Co. at Fording Mountain, 19 miles north of Natal, B.C., in the Crowsnest Pass region. It was a dry hole. Located in the Rocky Mountains over a mile above sea level, the well reached a total depth of 16,540 ft after a total of 230 days of drilling. Another remarkable achievement and also a Canadian record, was that 15,472 ft of the hole were uncased during the drilling operation.

Erratum

Our October issue referred to exploratory drilling by Mobil Oil of Canada in the Maritime Provinces. That notice was in error. Mobil is not doing any exploratory drilling in the Maritime provinces and the seismic survey referred to in that item was on the waters around Sable Island, followed by a land seismic survey on Sable Island.

Geophysical Operations Up

Best month in more than five years for relative activity was recorded by geophysical operators in October. There were 46 crews at work, down only 4% from 48 in the same month in 1959. Every other month since 1955 has shown a larger decline from the same month the previous year. Total 1960 crew-months are expected to be under 700.

Imports Control?

Canadian federal government sources have indicated that no consideration will be given to pleas for import controls, quotas, or a subsidized new pipeline to Montreal from western oil fields until at least some time in 1961. Recent cabinet shake-up is given as ground for holding up any positive action about oil markets.

Personals

PAUL L. KARTZKE, vice president in charge of exploration and production activities in Western Canada for the past nine years for Shell Oil of Canada, has been promoted to executive vice president with headquarters in Toronto. His appointment is effective January 1, 1961. During his stay in Western Canada, Shell has added huge oil and gas reserves.

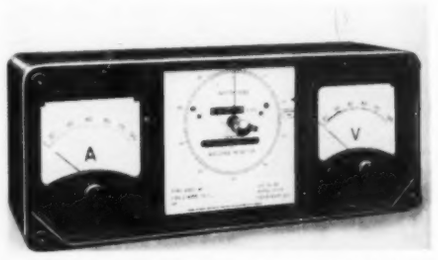
JOHN F. REDMOND has accepted a position as vice president in charge of exploration and production with Shell Oil Co. of Canada, Ltd. He assumed his new post January 1, 1961. He is now manager of the head office exploration and production economics department for Shell Oil Co. **E. G. CHRISTIANSON** will succeed Mr. Redmond.

LONDON LETTER *(Continued from page 12)*

British Equipment Notes

Cape Insulation & Asbestos Products Ltd. has been formed as a subsidiary of The Cape Asbestos Co. Ltd. to take over management of the thermal insulation, packings, jointings and textile sides of their business. It will also be responsible for manufacture and sale of materials made at all UK Cape Asbestos factories and for the present contracts division. Managing director of the new company is A. G. Grant (previously general commercial manager of Cape Asbestos); A. S. Runacres (previously manager of the marine division) is sales director; and J. L. Galloway (previously manager, oil and power division) is sales manager for the UK. Mr. Runacres was a director of Caltex Trading & Transport before joining Cape Asbestos in 1956.

A number of new items were to be seen in London recently at an *English Electric Co.* Exhibition "Focus on Welding" which is to be shown in other parts of the country. Prominent among these was the LWAD oil-cooled range of equipment, unique in giving either a-c or d-c output at the turn of a switch; the silicone diode rectifiers are also air cooled and so cannot be



over-heated. A new meter was announced, designed to measure electrical conditions in a welding arc, which has many applications from costing and calculating efficiency to improving production techniques. "Super Stainees," a new electrode, is claimed to deposit 50% more metal than conventional types.

Whessoe Ltd. has formed a Nigerian associated company, Whessoe Engineering Ltd., with headquarters in Port Harcourt (P. O. Box 57) to provide erection and manufacturing services for its products, including storage tanks and associated plant. Although Whessoe has built 106 tanks in the area since 1950, this step marks a new phase in its operations there which is indicative of belief in Nigeria's sound economy and steady development.

Better RESULTS

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Nalco's specialized chemicals and services for the petroleum industry are sold with the single aim of producing successful results. Broad experience with effective chemicals and methods, continuous research and development, and the skilled manpower to follow through on the job get these results in petroleum industry locations throughout the world. For action on any of the Nalco specialties listed here, contact your Nalco Representative, or the nearest Nalco office. Detailed literature on any of these products and services is yours for the asking.

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Desalting Chemicals
Howe-Baker Desalting and Desulfurization Equipment
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Cooling Water Treatment
  Corrosion Control and Deposit Prevention
  Microbiological Control

IN STEAM SYSTEMS

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  Deposit Prevention
  Corrosion Control
  Foam Prevention and Carryover Control
  Condensate Corrosion Control
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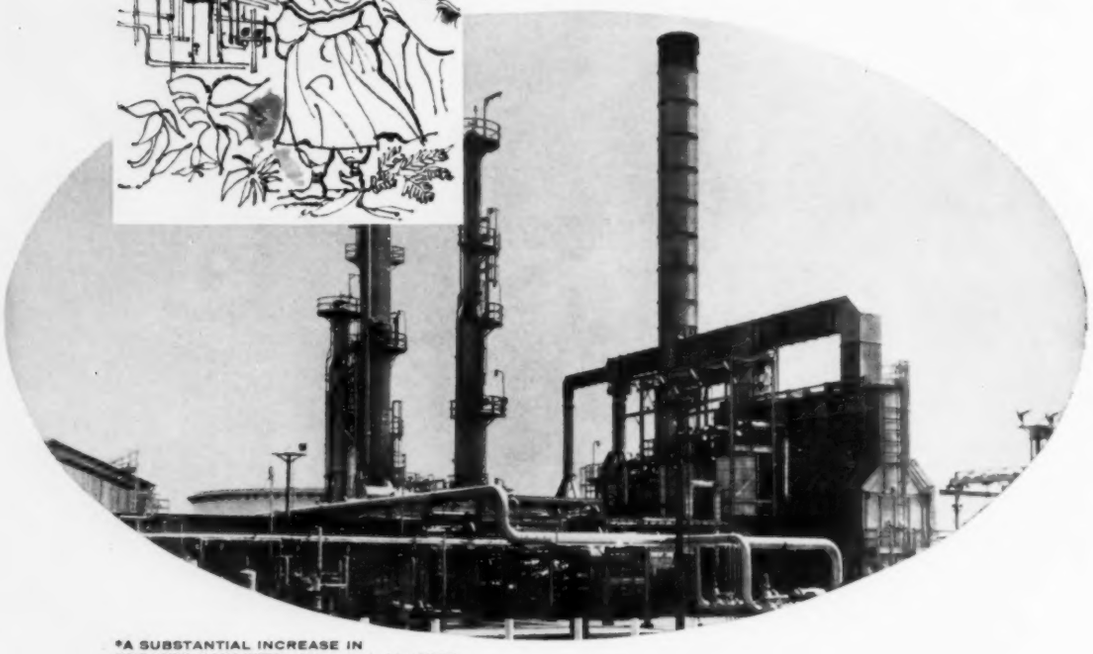
GERMANY: Deutsch Nalco-Chemie G.m.b.H., Schillerstrasse 31, Frankfort a. M., Hessen, Germany
ITALY: Nalco Italiana, S.p.A., Via Sardegna, 50, Rome, Italy
MEXICO: Nalco de Mexico, S.A. de C.V., Baja California, 210-Despacho 604, Mexico 7, D.F. Mexico
SPAIN: Nalco Espanola, S.A., General Martinez Campos 41, Madrid, Spain
VENEZUELA: Nalco de Venezuela C.A., Apartado 11326 Chacao, Caracas, Venezuela
UNITED STATES: General offices and laboratories, Chicago 38, Illinois; Other Nalco subsidiaries serving the petroleum industry: Visco Products Company, Houston 25, Texas, Howe-Baker Engineers, Inc., Tyler, Texas

*'62 could be the year for you



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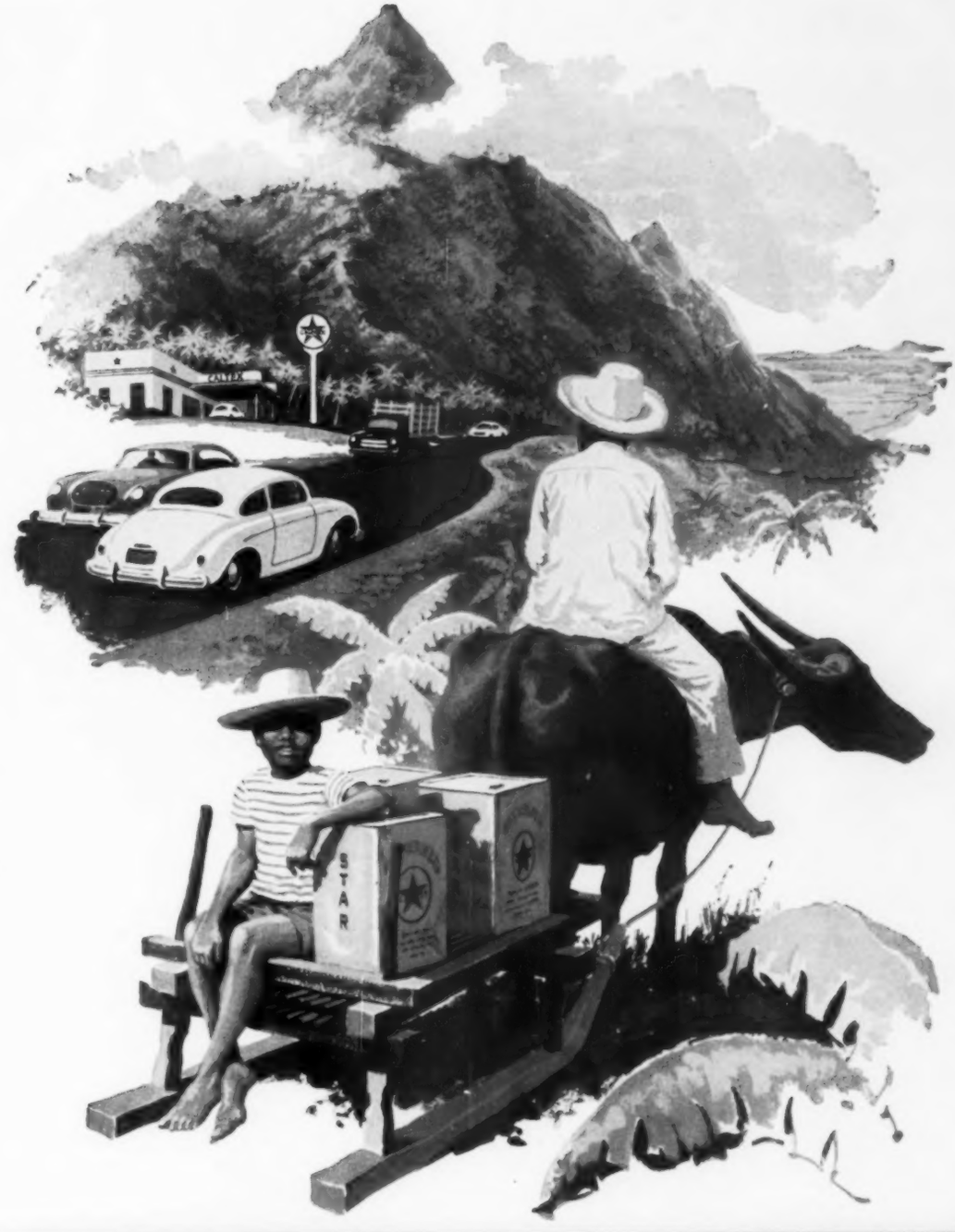

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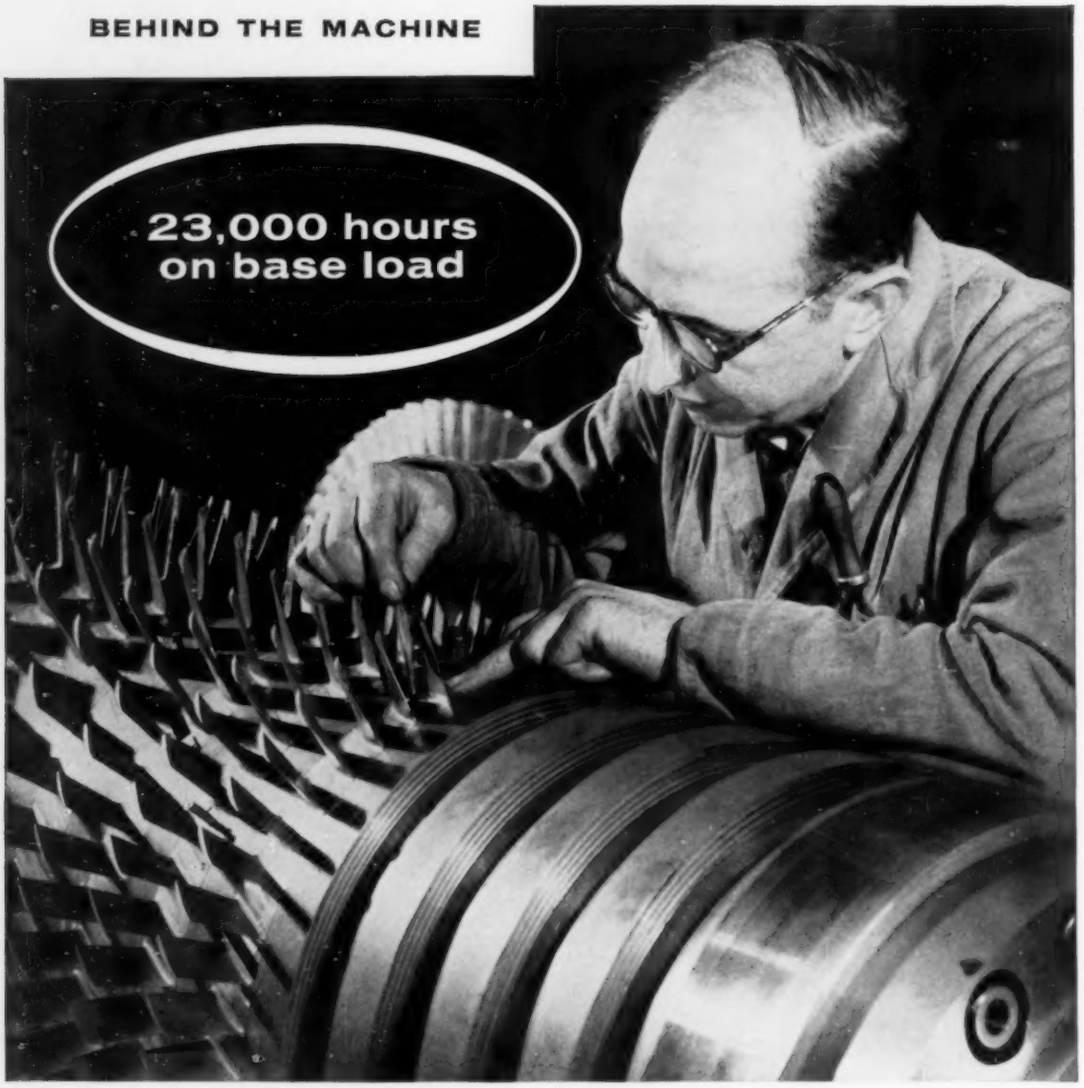
BEHIND THE MACHINE



The proved reliability of AEI industrial gas turbines is typified by a machine in Venezuela which has recently completed 23,000 hours running on base load. AEI makes a range of industrial gas turbines with ratings from 1,750 kW upwards designed to run on gaseous or liquid fuels.

The picture shows work on the compressor rotor of L2IC gas turbines being built, at the AEI Turbine-Generator Division Factory for the Basrah Petroleum Co. These feature a single shaft design which ensures stable regulation and makes them particularly suitable for parallel operation with other generating equipment.

This is a product of AEI Turbine-Generator Division, Britain's largest manufacturer of Turbine-Generators.

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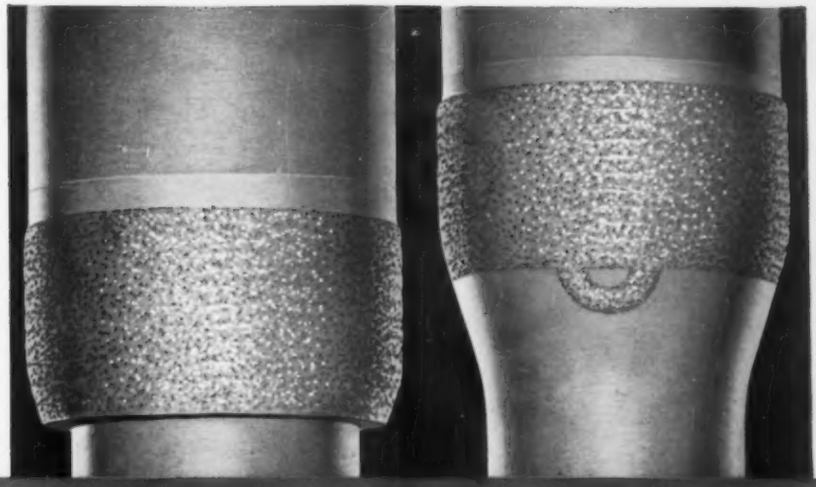

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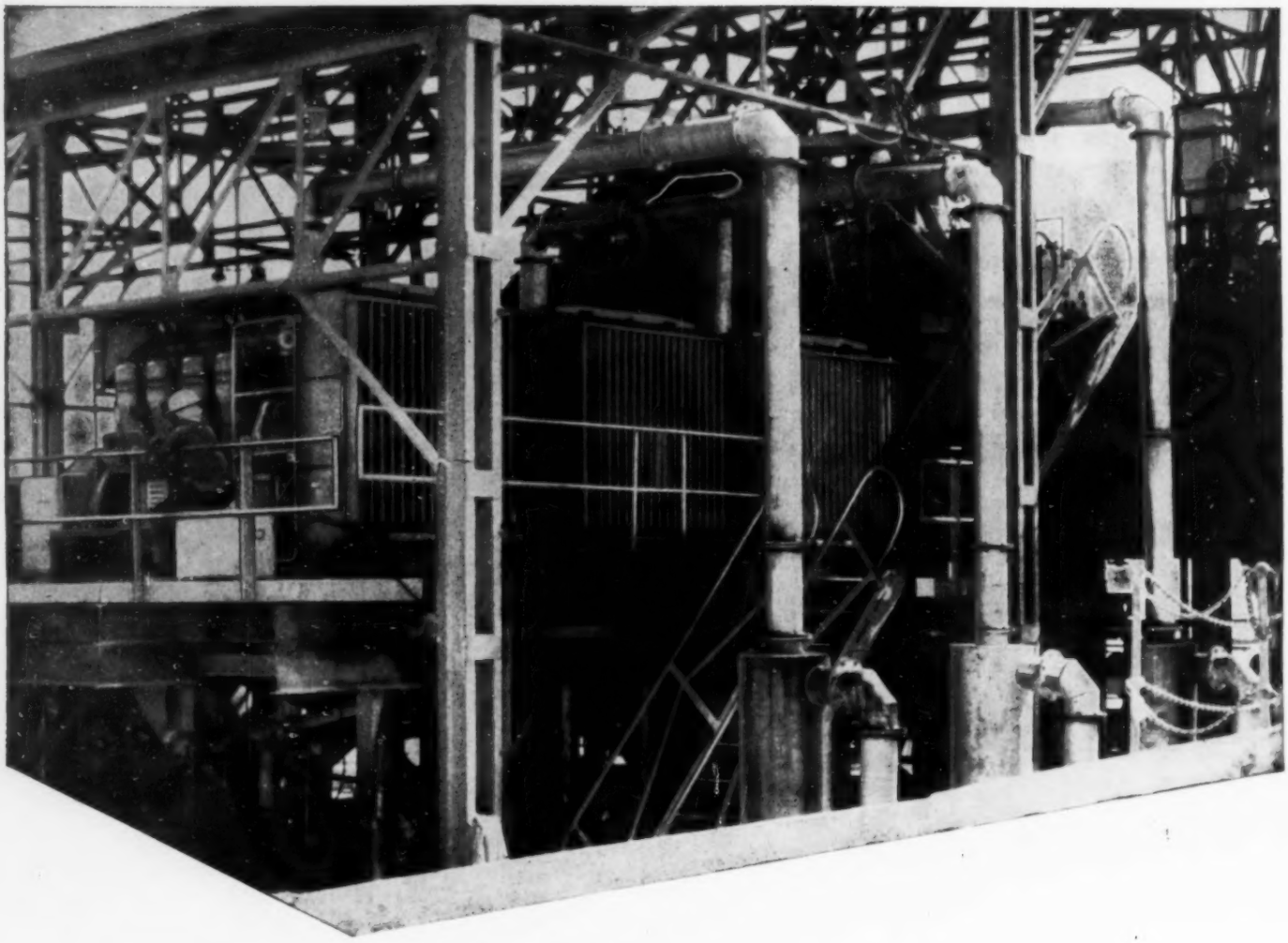
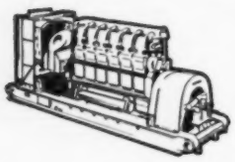
Reed is proud to announce the newest, most effective method of hard banding tool joints. This new process, "INARCLAD-60," is the result of Reed's accelerated research program. This program entailed several years of research and major expenditures for capital equipment. New production facilities control the entire process from pure tungsten to the INARCLAD-60 applied on the tool joint.

Reed's research in the laboratory and in the field has developed the optimum hard banding for more abrasive resistance and therefore longer tool joint life. Reed now offers, as standard tool joint hard banding, three different applications of tungsten carbide, each of which covers a full three inches on the joint.

For complete details, call your local Reed man or write — REED ROLLER BIT COMPANY, P. O. BOX 2119, HOUSTON 1, TEXAS.



Deep drilling at Qatar



The largest drilling rig in the Middle East has been commissioned by the Iraq Petroleum Company in the Dukhan Field, Qatar, where it is intended to penetrate to 18,000 feet. This rig is powered by three 'ENGLISH ELECTRIC' 8VD dual-fuel engines and can attain much greater depths.

Each package set is of 525 b.h.p. continuous site rating at 775 r.p.m. Two additional 8VD units drive an independent slush pump.

Two other rigs are each powered by two 8V diesel engines with continuous site ratings of 600 b.h.p. at 850 r.p.m.

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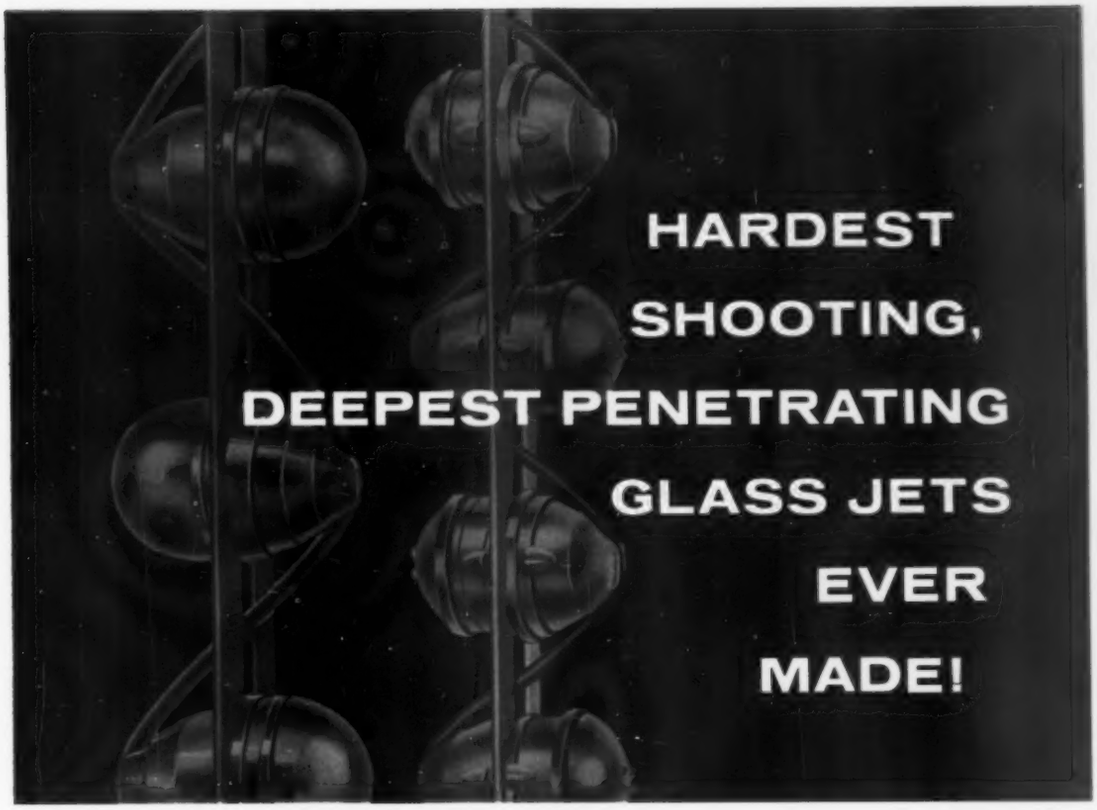


OVER 9" OF PENETRATION IN HARD BEREA SANDSTONE

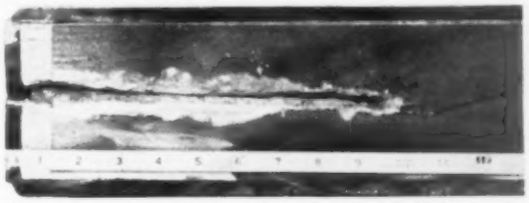
Two more powerful, deeper penetrating Glass Jet Units are now available from McCullough. They are improved Super Casing Glass Jets carrying 25 and 35 grams respectively and are run in flexible Steel Strip Carriers to perforate 4" OD casing and larger.

In tests conducted in standard Berea Sandstone targets, penetration for each size was greater than ever before achieved—more than 9" in these very hard targets and with excellent well flow index.

McCullough Glass Jets are the only expendable jet charges that are relatively junk free. When fired they disintegrate into a harmless powder of silicon and lime. No carrots are formed. Fragments of junk, usually associated with other expendable jet perforators, are eliminated. The Steel Strip Carrier is removed from the well after the gun is fired on the electric wire line.

For deeper penetration—peak production—use improved McCullough Super Casing Glass Jets on your next job.

The 25-gram Super Casing Glass Jet is available in 3¼" OD and 3¾" OD gun diameters. The 35-gram size is furnished in 4" OD and 5" OD diameters. Perforators may be any length required to perforate several intervals on one run in the well. This is accomplished by leaving blank sections in the length of carrier where perforating is not required.



Standard Berea Sandstone target perforated by 25-gram improved Super Casing Glass Jet at ½" clearance. Average penetration of a series of tests—9.312". Average entrance hole size—0.375". Pressure rating—20,000 psi. Temperature rating—300°F.

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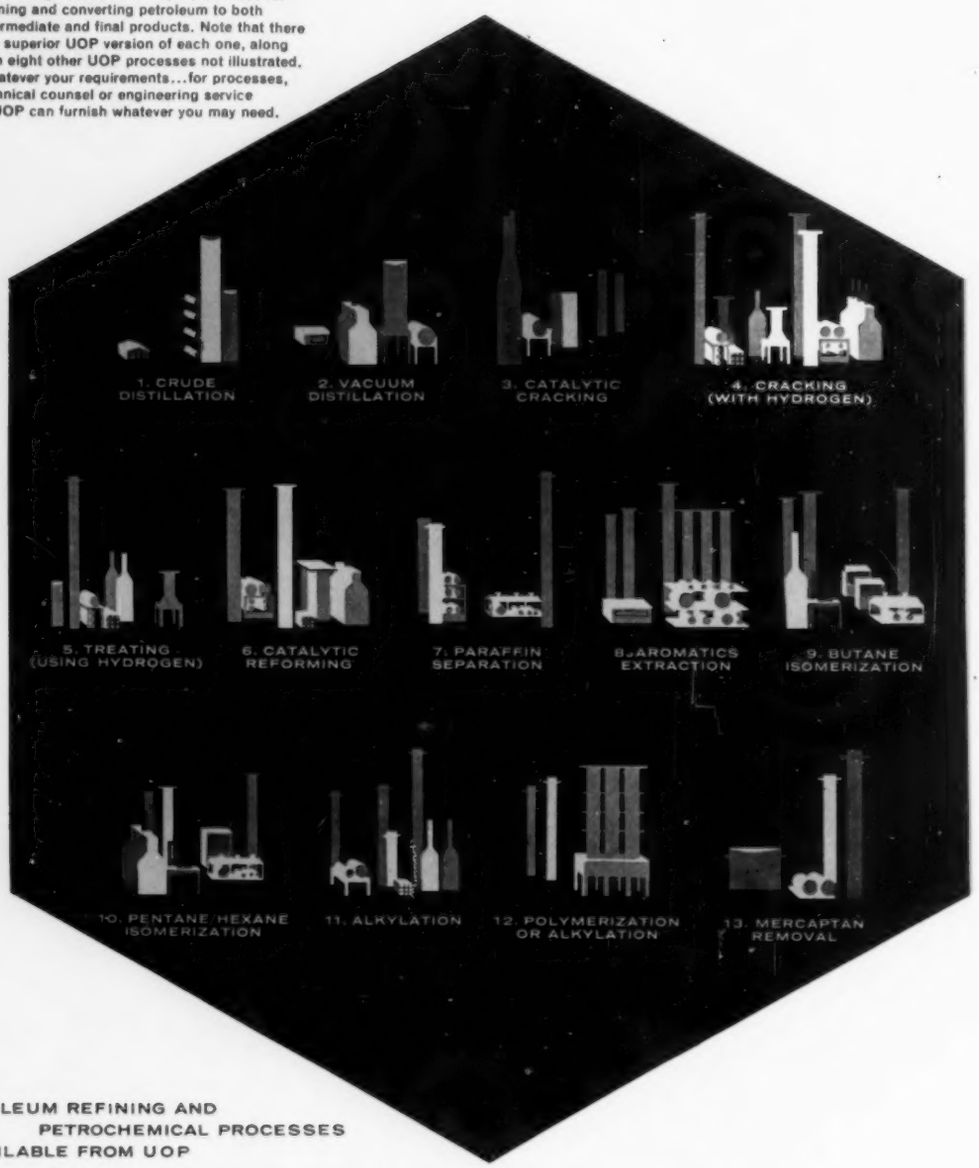
Here are symbolized the major processes for refining and converting petroleum to both intermediate and final products. Note that there is a superior UOP version of each one, along with eight other UOP processes not illustrated. Whatever your requirements...for processes, technical counsel or engineering service ...UOP can furnish whatever you may need.



PETROLEUM REFINING AND PETROCHEMICAL PROCESSES AVAILABLE FROM UOP

1. CRUDE DISTILLATION equipment is designed and engineered by UOP in any desired capacity.

2. VACUUM DISTILLATION and **VISBREAKING**—easy-to-operate processes for preparation of feed stocks for catalytic cracking.

3. FLUID CATALYTIC CRACKING—an improved process that gives higher yields, higher octane numbers.

4. LOMAX™—highly flexible process that converts middle distillates and vacuum gas oils into gasolines and distillate fuels of outstanding quality.

5. UNIFINING™—a modern process that completely purifies petroleum distillates.

6. PLATFORMING® produces high octane gasolines, high purity aromatics.

7. MOLEX™—a new continuous separating process that removes lowest-grade hydrocarbons from gasoline.

8. UDEX®—the ideal process for separation of super-purity aromatics.

9. BUTAMER™—a new and practical process for producing isobutane.

10. PENEX®—a new process that converts light, normal paraffins to isoparaffins.

11. HF ALKYLATION—makes alkylate, top anti-rumble motor fuel. Sulfuric acid process also available.

12. CATALYTIC CONDENSATION—converts olefin fractions of refinery gases into high-quality gasoline and petrochemicals.

13. MEROX™—a new and inexpensive treating process to remove mercaptans from gasolines and light distillates.

PROCESSES NOT ILLUSTRATED:

REXFORMING®—the ideal process to insure your top octane position.

CATALYTIC DEHYDROGENATION—removes hydrogen from hydrocarbons to produce less-saturated hydrocarbons.

HYDEAL™—a new process for the hydrodealkylation of toluene or C_8 aromatics to produce benzene; may also be used for manufacturing phenol and naphthalene.

HYDRAR™—converts benzene to cyclohexane with excellent yields, achieves extreme high purity with Udex grade benzene.

OLEFIN EXTRACTION—efficiently separates olefins and diolefins from paraffins; prepares olefins for further conversion.

AROSORB™—removes heavier aromatics from synthetic and natural distillates, produces aromatic-free heavier distillates.

ALKAR™—produces ethylbenzene, cumene and other alkylated aromatics from Fluid Cat Cracker off-gas streams.

UNISOL®—an economical process for treating high mercaptan-containing gasolines.

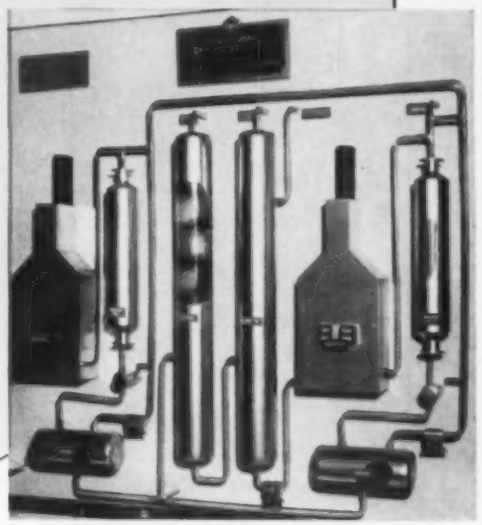
'62 COULD BE
THE YEAR
FOR YOU!

how to make products your customers want to buy...

Described below is the new and versatile UOP process . . . LOMAX. A remarkable and ultra-flexible cracking-with-hydrogen process, LOMAX enables the refiner to reach a new high in operating flexibility. He can convert his middle distillates into the most *immediately saleable* ratio of gasoline and distillate fuels . . . and change his ratio to fit the changing needs of his market.

With UOP processes the refiner can accomplish just about anything that comes within the realm of practical petroleum refining technology. Take a look at the brief descriptions on the opposite page, and you'll agree. And remember, in many cases existing equipment can be revamped and expanded, and thereby will produce more saleable products.

*INFORMED OPINION indicates that 1962 will require a substantial increase in process capacity ...NOW is the time to start your planning! Ask us about a preliminary proposal... no obligation!



LOMAX™ With this new and highly flexible UOP process, model of which is shown above, the refiner is able to increase production of his most currently saleable product on a year-'round basis. Through the catalyzed reaction of oil with hydrogen, LOMAX converts middle distillates ranging from kerosines to heavy gas oils into a wide ratio of gasoline or distillate fuels.

As seasonal demands change, LOMAX production of these products is adjusted accordingly.

Important additional benefits afforded by LOMAX include distillates of exceptionally high purity (even from sour crudes) . . . predominance of branched isomers in light hydrocarbons . . . greatly reduced quantities of light gases . . . olefin-free products . . . long catalyst life . . . and other advantages.

LOMAX may be used to supplement existing facilities, or as a basic cracking operation in a new installation.

UOP®
UNIVERSAL OIL PRODUCTS COMPANY
30 Algonquin Road, Des Plaines, Illinois, U. S. A.
WHERE RESEARCH TODAY MEANS PROGRESS TOMORROW

by William C. Uhl
Processing Editor

Highlights of the month—Petrochemicals continue as major sales outlet for LPgases. New developments in underground storage for LPG. New market potentials for LPG in processes for desalinification of sea water

Chemical manufacturing continued to be the fastest growing outlet for liquefied petroleum gases as the USA's LPG industry itself recorded another good year in 1960. Total sales for LPG were estimated at 9.86 billion gals, an increase of 10.5% over 1959, according to the annual year-end review by Phillips Petroleum Co. economists.

Sales to chemical markets rose 20%, to 3.03 billion gals; and this does not include the 550 million gals that went into synthetic rubber manufacture. The individual changes are tabulated as follows (in million gals):

End Use	1959	1960	% Change
Domestic & Commercial	3.94	4.33	10.0
Motor Fuels	0.89	0.94	6.0
Industrial, misc.	0.87	0.87	0
Gas Manufacture	0.18	0.14	—25.0
Chemical Manufacture	2.53	3.03	20.0
Synthetic Rubber	0.51	0.55	7.0
Totals	8.92	9.86	10.5

Among the more noticeable trends in the chemical market, the Phillips study team (W. F. DeVole, A. F. Dyer, and George R. Benz) reported these two:

(1) The preference ran to propane as a feedstock instead of butane, primarily because of its lower cost. This was accelerated last year as new alkylation units and rubber plants came into operation.

(2) Ethane increased more rapidly than did propane as a chemical feedstock. Approximately one-third of the total amount of LPG going into chemical manufacture was ethane and ethylene. The trend is expected to continue in 1961.

Although the growth rate could level off to a certain extent in the future, the Phillips economists do not expect any rapid decline, and rather are looking forward to a continued healthy growth because the markets are far from saturated.

Production during 1960 was maintained at a pace to meet the increased demand. A total of 39 new gasoline plants and 9 plant-expansion projects were completed in the USA, adding 3.2 million gal/day to the industry's production capacity.

An interesting development in the design and engineering of underground storage for LPG was achieved late in 1960, when Sun Oil Co. dedicated a 400,000-bbl storage cavern cut out of solid granite rock some 420 ft below the surface of its Marcus Hook, Penna., refinery.

Built by Fenix & Scisson, Inc., mining engineers of Wilmington, Del., the facility has been described by some industry people as probably "the final answer to the safe and practical storage of various volatile petroleum products and by-products."

The design feature is the shaft closure and fill line developed by Sun's research and engineering department, and shown in the drawing. The closure has a double head. The bottom of the fill line is immersed in water in the shaft sump to prevent leakage should damage occur to the upper head. An equalizer line and a nitrogen bubbler line are used to determine the liquid level in the storage cavern. The three-inch equalizer line also equalizes pressure between the cavern and surge tank.

Water may be pumped through the three-inch water lines to provide a water seal in the 14-inch casing shafts when it is necessary to remove the deep-well pumps for repair.

Sun estimates that the underground system provides a storage facility at a cost of from $5 to $7 per bbl, as compared to above-ground storage figures which can go as high as $50 per bbl. The project at Marcus Hook, made up of three excavations within a short distance of each other, represents about 20% of all mined storage in the world, it was said.

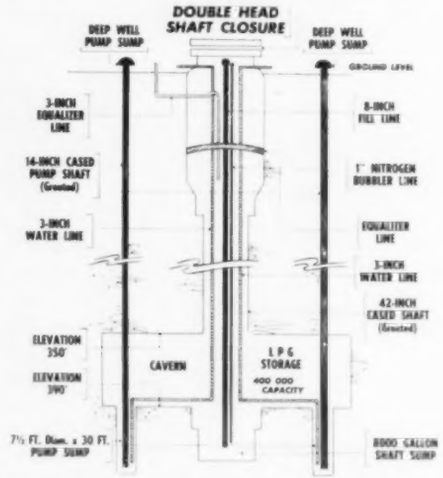


Diagram showing operation of Sun Oil's new underground storage cavern for liquefied petroleum gases

Other benefits accruing to this technique include: lower insurance rates, a higher safety factor, no maintenance, virtually fireproof, weatherproof and bombproof.

Perhaps further in the future in the LPG picture, yet nonetheless intriguing to many processors is a potential new market for propane and butane in sea water desalting, as indicated by two new processes reported at a Washington meeting of the American Institute of Chemical Engineers in December.

In one process, developed by Koppers Research, Inc., the propane serves as a hydrate-former. The other technique, from the research laboratories of Blaw-Knox Co., uses butane as a refrigerant and then re-uses it as a melting agent. Both processes are highly attractive from the cost standpoint because of low energy requirements.

Koppers' technologists feel their goal of a 10 million gal/day plant which can produce fresh water for less than 50¢ per 1,000 gals is attainable. Their laboratory results are leading to construction of a pilot plant. With Blaw-Knox, cost for a 10 million gal/day plant was estimated at $20 million, and operating cost for power and chemicals comes to about 19¢ per 1,000 gal. A pilot plant has been built with 35,000 gal/day capacity.

In the hydrate process, propane and water combine to form an insoluble clathrate, a compound in which a propane molecule is simply surrounded by water molecules—in a ratio of about 17-1—producing a stable crystal. These crystals are filtered out of the mother liquid, washed, and then are decomposed to form immiscible layers of salt-free water and propane.

A plant producing 10 million gal/day of potable water operates on about 25 million gal/day of salt water and produces also 15 million gal/day of brine.

The refrigeration is in two stages. Liquid propane forms the clathrate with water in the reactor, and then it vaporizes to remove the heat which was generated when the hydrate crystals formed. When propane is added, the hydrate-forming temperature rises about 11°F. Koppers people said this explains why there is a finite drop in production cost when potable water is produced by the propane hydrate process rather than by a conventional freezing process.

Studies of the process showed that a 40% conversion requires the minimum amount of energy. On this basis, it was calculated that in a continuous process, the hydrate would be formed from a 6 wt-% salt solution.

In Blaw-Knox's direct freezing process, sea water is partially frozen to slush by direct contact with boiling butane at a pressure just below atmospheric. Because butane boils below the freezing point of salt water, the heat of vaporization (165 Btu/lb for butane) is supplied by the heat of freezing the water (144 Btu/lb).

The slush is then washed free of salt with part of the product water. Then the washed ice is melted by the reverse of the freezing process. Product water and rejected concentrated sea water leave through heat exchangers. Experimental work is now going on to chose the most effective method of washing the ice.

Blaw-Knox said salinity could be reduced economically from 30,000 ppm of NaCl to 125 ppm, which is satisfactory for potable water.

What's New in Processing Plants

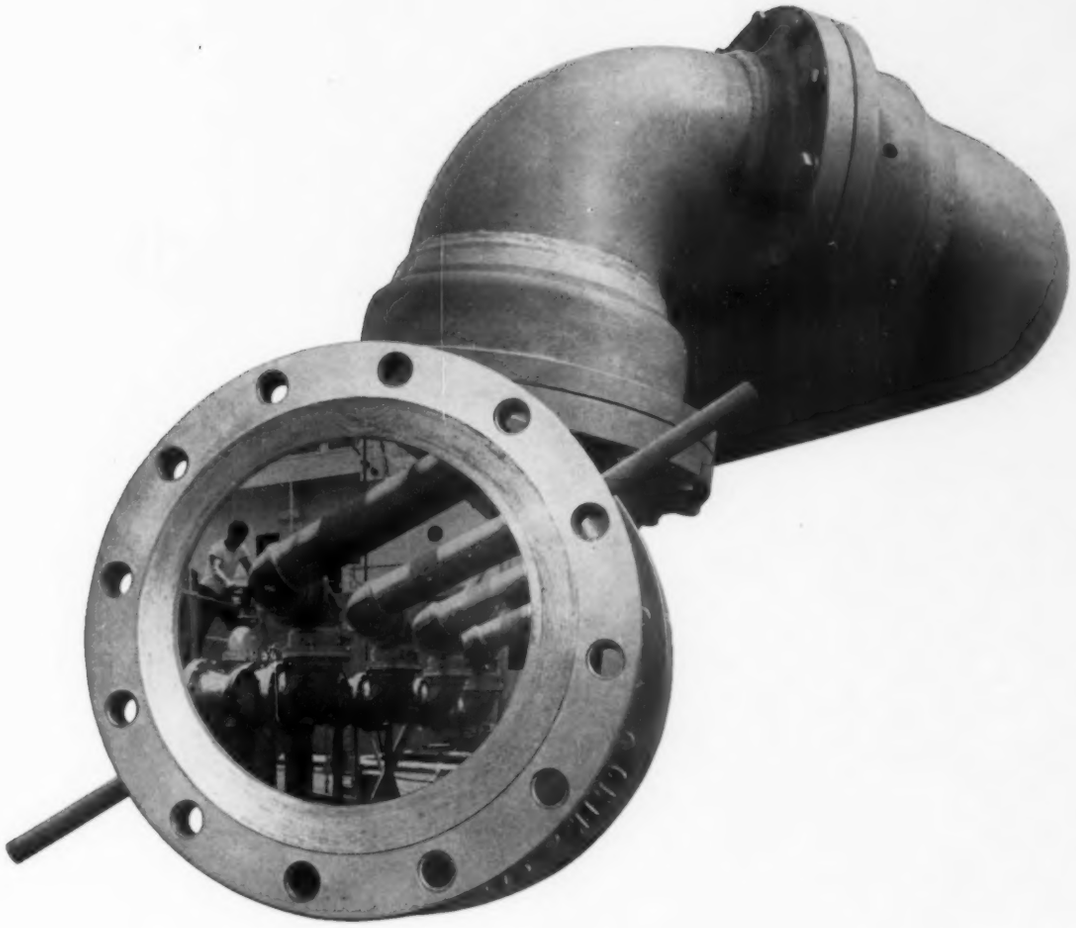
Gulf Oil Corp. has chosen Denmark as the location for its first refinery in Europe. A 30,000 b/d $19.6 million plant is to be completed by the end of 1962 at Stigsnaes in southwestern Zealand, a site with excellent potential harbor facilities for the largest and most modern tankers. When in full production, the refinery will employ about 200, and labor requirements during peak construction period are estimated at 1,000.

• • •

Mobil Oil has signed a contract with M. W. Kellogg for a new 15,000 b/d crude topping unit at its Coryton (Essex) refinery. Scheduled for completion early in 1962, the unit will be readily capable of expansion.

• • •

A $2.2 million, UOP 5,500 b/d coking unit, first of its kind in Japan, has gone onstream at Koa Oil Co.'s 35,700 b/d Marifu refinery in Yamaguchi prefecture. It will produce 60,000 ton/yr of low-sulfur coke from Duri crude oil coming from the Caltex fields in central Sumatra.



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And the heart of this system is the swivel joint. Produced by a company with 30 years of experience in solving flexible line problems. Proven by hundreds of installations around the world on Chiksan's Hydraulic Marine Loading Systems and other dockside loading lines. Recommended and preferred for safety and long life by responsible men everywhere. It is a **CHIKSAN** Swivel Joint.

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With $6 million in French bank credits, the government-owned Neste Oy 23,000 b/d refinery at Naantali, Finland, is now scheduled for expansion. The plant operates on Russian crude imported under a Soviet-Finnish trade agreement.

• • •

ENI, the Italian state oil entity, has signed an agreement with the government of Ghana for the construction of a 24,000 b/d refinery (with ultimate capacity of 40,000 b/d) near Tema.

• • •

J. Paul Getty has reportedly been discussing with West German chemical interests the erection of a 40,000 b/d refinery in the heart of Bavaria's industrial region, to be operated on Middle East crude. Getty is also said to be interested in a trans-Alpine crude oil pipeline from Venice into Bavaria.

• • •

YPF has completed a new 25-million peso, crude topping unit at the La Plata, Argentina, refinery, raising plant capacity by 20%.

• • •

An experimental, portable crude oil topping unit of 200 b/d capacity is to be put into operation at a well at Tierra del Fuego, Argentina. The $70,000 plant, designed for Tennessee Gas Transmission Co., will process crude at an estimated cost of $2 per bbl. The prime contractor was Williams Bros. Co. of Tulsa.

• • •

Under a new technical and economic cooperation agreement with the United Arab Republic, Russians will build a 25,000 ton/yr lube oil plant in Syria.

• • •

British American Oil Co. has placed in operation a 15 mmcf/d, dry desiccant, short-cycle natural gas plant near Gilby, Alberta, designed to recover 210 b/d of stabilized condensate.

• • •

Sun Oil Co. Ltd. expects to complete by May a 2,600 b/d $700,000, heating oil hydrodesulfurizer, at Sarnia, Ont.

• • •

Pan American Petroleum will operate a new "multi-million dollar" natural gas plant now under construction at West Whitecourt, Alberta, in the Windfall field which will process 177 mmcf/d of gas to produce 110 mmcf/d of sales gas and 650 ton/day of sulfur.

• • •

A number of Japanese companies are planning a $44 million 40,000 b/d refinery on an 840-acre site at Tsurusaki, in Kyushu, with completion anticipated for the fall of 1962. Tentative name of the operating firm is Kyushu Oil Co., and backers include Yawata Chemical Co., Kinoshita Shoten, West Japan Railroad Co., Taiyo Fishery Co., Kyushu Electric Power Co., Bridgestone Tire Co., and Onoda Cement Co.

• • •

Raffinerie Belge de Petroles S.A. has placed a 6,000 b/d gas oil desulfurization unit onstream at Antwerp, Belgium, the first of its kind to use a process developed by the French Petroleum Institute.

• • •

India reportedly has turned down Burmah-Shell's request for approval to expand its Bombay refinery.

• • •

British American Oil Co. Ltd. is installing a $1 million carbon monoxide boiler and extraction steam turbine at its Clarkson, Ont., refinery. To operate on flue gas from the cat cracker, the boiler will be capable of generating 165,000 lb/hr at 600 psig and 750°F. The 6,000 hp turbine will replace the main electric motor on the cracking unit. Combustion Engineering Inc. and Canadian Westinghouse Co. Ltd. are contractors. Project will be finished in the fall.

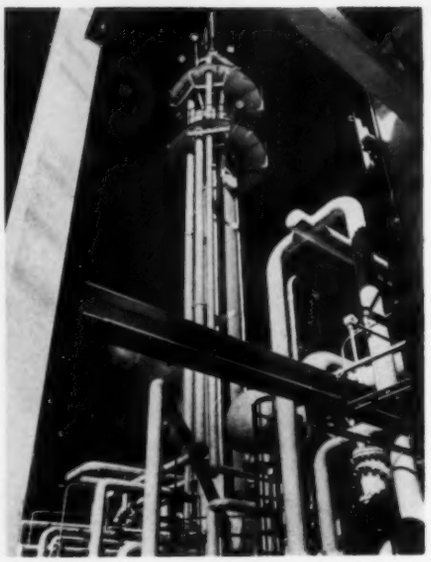
• • •

Shell Oil of Canada will complete by end of 1961 a $20 million, 100 mmcf/d natural gas plant in the Pincher Creek area of Alberta, with production capacity of 1,000 ton/day sulfur, and about 4,000 b/d of liquid products.

• • •

British Petroleum, through its associate Soc. Francaise des Petroles BP, will have an interest in two new refineries to be built in France and Algeria and to come onstream early in 1963.

Soc. de la Raffinerie de Strasbourg S.A. will build a 66,000 b/d, $61.6 million refinery at Herrlisheim, 15 miles north of Strasbourg; S.F.BP has a one-third interest. Soc. de la Raffinerie d'Alger will erect a 50,000 b/d, $47.6 million refinery at Maison Carree, near Algiers; eight companies are participating and S.F.BP has a 10.4% interest. The Algerian plant will comprise an atomospheric crude still and a catalytic reformer to process Hassi Messaoud crude and Hassi R'Mel condensate.



Part of the recent modifications made by Gulf Oil at its Port Arthur, Texas, ethylene manufacturing unit. Gulf has been the largest producer of this petrochemical since 1953.

What's New in Petrochemicals

British Geon Ltd. (55% Distillers Corp. and 45% B. F. Goodrich Co.) plans a further "major addition" to its polyvinyl chloride capacity at Barry, South Wales, England, when the present £ 2 million expansion project is completed, about mid-1961. This is expected to increase the present 30,000 ton/yr capacity by some 50%.

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Houston Chemical Corp. (a majority-owned subsidiary of Philadelphia and Reading Corp.) and Great Lakes Chemical Corp. have formed a new jointly owned firm on a 50-50 basis, Arkansas Chemical Inc., with plans to complete a bromine manufacturing plant near El Dorado, Ark., early in 1961. It will operate on oil-field brines. Arkansas in turn will sell a substantial part of the bromine to Houston for conversion to ethylene dibromide at the TEL-TML plant it will complete at Houston, Texas, in September. Great Lakes will buy the balance of the bromine for resale and for use in its manufacture of ethylene dibromide, methyl bromide, and other products.

• • •

Imperial Chemical Industries Ltd. will build a fourth unit at Billingham, England, for making plasticizer alcohols by the carbonylation of olefins. With a capacity of 30,000 ton/yr, it will raise ICI's carbonylation alcohols capacity to more than 140,000 ton/yr. Development work is also under way to modify the processes used in this manufacture. In addition, capacity is being increased in an existing unit that produces butanol and iso-butanol by the carbonylation of propylene.

• • •

Suntide Refining Co. will start constructing an ethyl benzene separation unit at Corpus Christi in March, with completion expected early in July. The 30 million lb/yr unit will be a further separation step of the mixed xylene product of Suntide's Udex unit and will operate in conjunction with the Udex and orthoxylene separation units. Badger Mfg. Co. has the contract for process design, engineering, and construction.

• • •

In a move toward attaining self-sufficiency in hydrocarbon raw materials, Monsanto Chemical Co. has announced plans for a major petrochemical plant on a 3,000-acre site at Chocolate Bayou, Texas, with completion planned for 1962. The facility will include the world's largest ethylene plant, with a capacity of 500 million lb/yr, as well as units to produce 42 million gal/yr of benzene, 50 million lb/yr of naphthalene, at least 50 million lb/yr of phenol, and undisclosed quantities of propylene, cumene, acetone, ethyl benzene, and other hydrocarbons. Monsanto engineers will work on the project, with Bechtel Corp. assisting in design and construction.

• • •

A new plant to be built at Niigata, Japan, by Kyowa Gas Kagaku Kogyo K.K., a subsidiary of Kyowa Hakko Co. and Nippon Mining Co., will produce 27 ton/day of acetylene from nautral gas, and 100 ton/day of methanol.

• • •

Pakistan Industrial Development Corp. plans another ammonium sulfate fertilizer plant, one of 250,000 ton/yr capacity near Sukkur.

• • •

Brockville Chemicals Ltd. expects to complete its $17 million nitrogen chemicals plant near Maitland, Ontario, in May, 1961.

• • •

Lago Oil & Transport Co. Ltd. is considering construction of a $41 million complex at Aruba, Netherlands West Indies, to produce aromatics, synthetic ammonia, urea, and nitrogen fertilizers.

• • •

Columbian Carbon Co.'s $5 million, 40 million lb/yr carbon black plant at Hamilton, Ontario, will be completed in the second quarter of 1961.

New Water-in-Hydrogen Meter

The problem of monitoring ppm of water in hydrogen has been solved by a new instrument developed by Consolidated Electrodynamics Corp. It is expected to be of considerable use to refiners using hydrogen streams in process operations.

Accurate measurement of water in hydrogen streams with electrolytic moisture monitors had formerly been impossible because oxygen generated by electrolysis would recombine with hydrogen and give an erroneously high reading, often exceeding actual moisture content by several hundred per cent. CEC's research found that the "hydrogen effect" is independent of the flow rate of the sample through an electrolytic detector cell. Thus, water content can be determined by simply taking two readings at different flow rates.

Test results proved out the expectations and the CEC Type 26-301 Moisture Monitor is the product.

New Publications by the API

Several new publications have been announced by the American Petroleum Institute. They may be obtained, at the prices indicated, from the API Publications Department, 1271 Avenue of the Americas, New York 20, N. Y.

"API RP 525, Testing Procedure for Pressure-Relieving Devices Discharging Against Variable Back Pressure," 50¢ per copy, establishes a method of conducting tests to determine performance characteristics of a given design of pressure-relieving device which is required to operate under variable superimposed back-pressure conditions with compressible fluids.

"Chapter III, General Preliminary and Preparatory Work, of the Guide for Inspection of Refinery Equipment," $1 per copy, covers scheduling, checking inspection tools and instruments, and preliminary work for major inspections.

"Use of Plastic Foam to Reduce Evaporation Losses," Bulletin No. 2515, $1 per copy, prepared by the API's Evaporation Loss Committee, discusses test methods for measuring loss, loss reduction in both static and working service, disappearance of foam particles, and reduction in corrosion rate for the use of plastic foam.

Phillips Develops Jet Fuel Additive

A new chemical additive which prevents in-flight ice formation in aircraft jet fuel systems, developed by Phillips Petroleum Co. has been approved by the United States Air Force for use by the Strategic Air Command.

Called PFA 55MB, the new compound is immediately available in sufficient quantities to meet the needs of both military and commercial jet aircraft and guided missiles using jet fuel. The material has been proved satisfactory and effective in a year of flight tests by Boeing Airplane Co. and thousands of hours by the Wright-Patterson Air Force Base.

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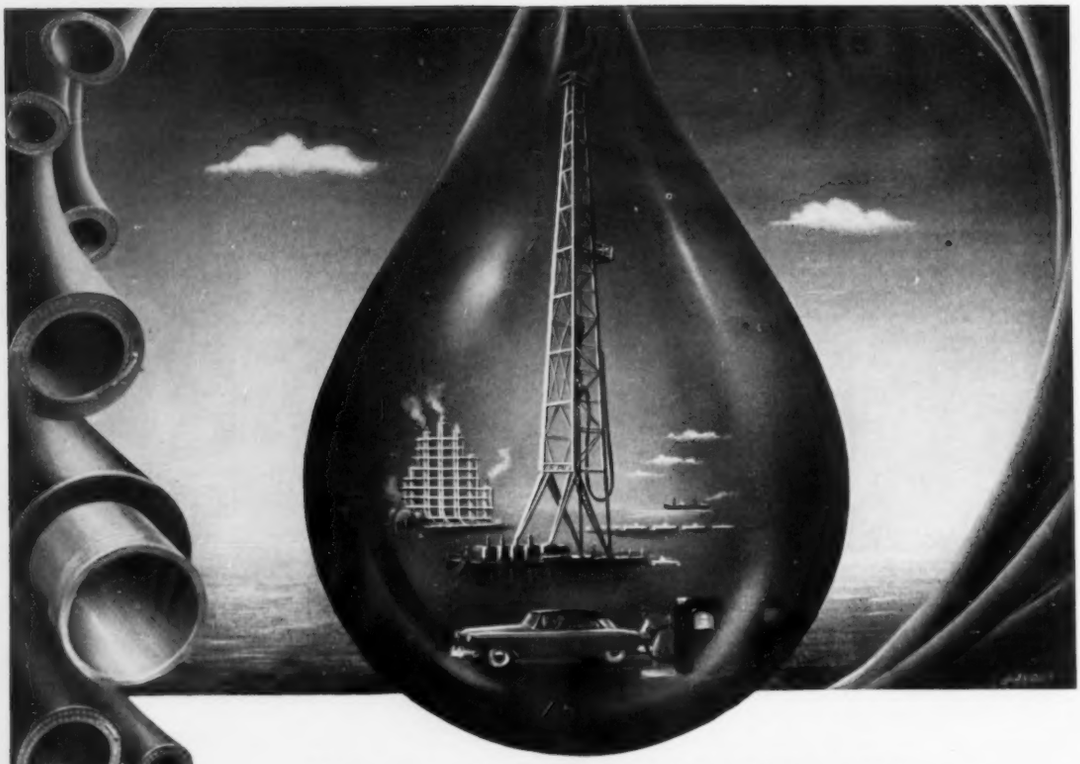

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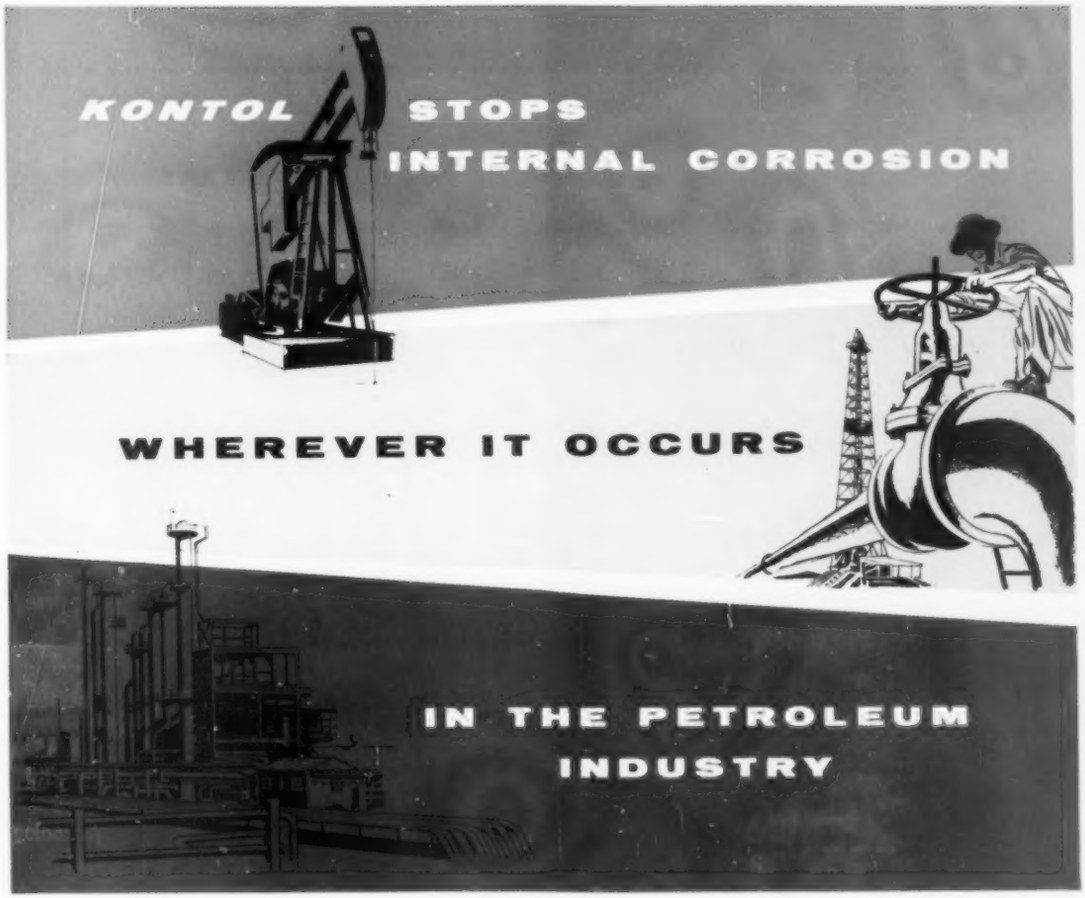

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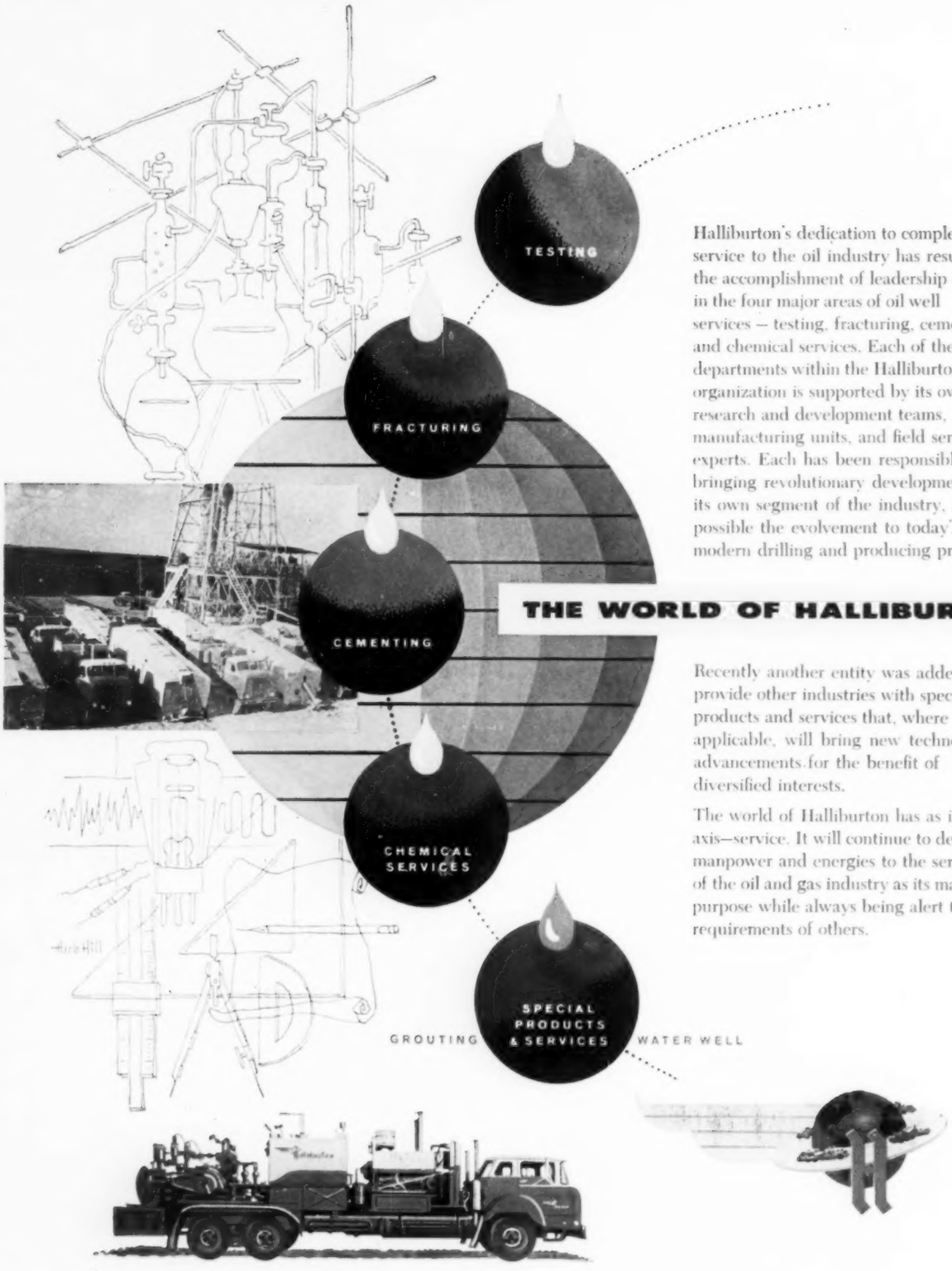

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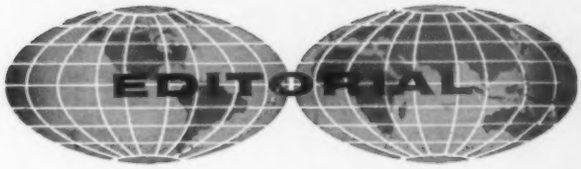


DISASTER IN BRAZIL

A strange and troubling story has come out of Brazil. It relates to Petrobras, the government's oil company, and it has grave implications for Brazil and the western oil world. It concerns Brazil's long and expensive hunt for oil—the world's most expensive effort by a single company—and the failure to find it. It means that Brazil will probably never be self-sufficient in oil, with all that implies for the economic development of one of the world's largest countries that contains approximately half the population of South America.

This conclusion is not new. It was reached several years ago by the persons responsible for exploration there. What is tragic is that this fabulously expensive oil hunt, costing over $300 million so far in non-productive areas, is probably going to continue in the face of certain failure, so far as it is technically possible to say so. And why? Because of politics.

There seems no room for doubt that the country's oil potential is not even a fraction of what was so fondly hoped five years ago. The Brazilian press has published in exact detail the confidential reports submitted by Walter Link, Petrobras exploration chief since 1954. His final evaluation of the industry's present state is the result of all Petrobras's effort, since he has been in charge of that company's exploratory effort virtually the entire period of Petrobras's existence. In his educated opinion, outside the small coastal basins of Bahia and Tucano there are no good prospects for oil discovery in Brazil. Without going into technical geological reasons, the proper conditions for oil accumulation in Brazil (outside Bahia and Tucano) do not exist and prospects are about zero. This is not just Link's opinion. His opinion was published, along with that of 14 other Petrobras geologists, seven of them Brazilian, and their consensus is the same.

In his final report, Mr. Link outlined an exploratory program for 1961. In it he expressly stated his view that exploration in the massive interior basins of Brazil was a waste of time. He outlined a program of exploration for these same basins however, stating in his accompanying remarks to Petrobras directors and its president that he did so "in case management decides to explore in these basins *for other than geological reasons.*"

What reason could there be for exploring one of the most difficult and expensive areas in the world, if not geological? That reason is well known: politics. Nationalistic elements in Brazil rode to power on "O Petroleo é Nosso" (The Oil Is Ours). They created the monopoly and feed on it. Petrobras has grown to be the largest company in Brazil of any kind. Its payroll is enormous, and so is the total of people working for it. Disregarding sound advice to contract out specialized work, Petrobras is doing its own. Now dismissal of unneeded employees would cause a major upheaval. It might be politically impossible to reduce the labor force effectively.

The situation would be hilarious, a sort of tragic and yet comic opera, if the Brazilian people could afford it. Of the top management of Petrobras, the president and the four directors, *not one* has any oil experience worth mentioning. Incredibly, the largest company in Brazil is run by management without any business experience *of any kind*. The latest director named at this writing has the qualification of having run the President of Brazil's excursion boat.

The sad story is not told yet. There are some small producing fields along the coast and Petrobras in recent years has had great success in extending them. Now, however, for political reasons they are being over-produced. They rose to a total of over 100,000 b/d at the last of 1960, and at the same time were blowing 40 million cubic feet of gas.

Worse yet is the shadow of corruption which hangs over the whole oil picture. Honest Brazilians deplore the situation. They know their warm hearted and likeable people cannot afford this extravagance for the benefit of a few. The petroleum monopoly is not efficient, but its existence is the wish and choice of Brazil—it is an internal matter. But this is a time of crisis. The free world is challenged and we cannot afford mistakes now. The continued intensive exploration by Petrobras of those areas condemned for geological reasons is a sad mistake.

ENI operates world-wide

Enrico Mattei may be controversial, but nobody denies he is dynamic. Under his guidance ENI has become a distinct force in the international oil scene, with operations that extend far beyond Italy's borders

by Enrico Mattei

WHEN ENTE NAZIONALE IDROCARBURI—E.N.I.—was set up in February, 1953, and this state-owned company was granted exclusive rights to explore for, develop and transport hydrocarbons in the Po Valley, there was criticism from many quarters. People said that E.N.I. did not possess the adequate financial and technical resources, the experience and the necessary number of men to carry out such an arduous undertaking over an area of this size (21,230 sq. miles) and so there would inevitably be a delay in exploiting the hydrocarbon resources of the Po Valley to the full.

However, in the course of a few years, E.N.I. has not only implemented an impressive program in the Po Valley leading to the discovery of a number of gas-bearing fields yielding today around 6 billion cubic metres of gas per annum, but has also extended its operations over the whole of the rest of Italy's mainland and to Sicily where it is at present by far the most important operator. The main results achieved in these areas are the discoveries of the large Gela oil field in Sicily in 1957 and of the Ferrandina gas field in Lucania in 1959.

While doing all this, E.N.I. was also engaged in constructing an extensive natural gas pipeline network, in enlarging and modernizing its refineries and petroleum products road distribution systems, in building a big plant at Ravenna for making synthetic rubber and nitrogenous fertilizers with natural gas as starting material, in beginning the erection of a nuclear power plant at Latina and—just recently—in building another large petrochemical plant at Gela which will use the local crude oil as feedstock.

E.N.I. today controls over 70 subsidiary companies employing more than 21,500 people and supplies 21% of the whole of Italy's energy requirements. In 1959 turnover was Lire 361.1 billion (about US$582.4 million) and the refineries in which it has an interest processed 5.4 million tons of oil.

In its search for sources of energy E.N.I. has not restricted itself to Italy alone. It has tried to open up fresh opportunities for obtaining supplies of oil from the main areas where foreign companies have been operating for several decades now and where Italy had no place.

The rapid development of Italy's economy made it both possible and absolutely necessary to establish a broadly-based national oil policy which would in due time enable the huge demand for energy to be met from direct sources of supply. It must be borne in mind that overall energy consumption in Italy rose by an average annual rate of 8.2% between 1950 and 1958. Growing supplies of natural gas, increased road traffic, the trend towards replacing coal by petroleum products and the unlikelihood of increasing hydroelectric output have all helped to make liquid and gaseous hydrocarbon consumption increase at an even higher rate, 15.5% per annum, during the same period. Future estimates are also significant. Hydrocarbon consumption is expected to advance at an annual average rate of 8.7% between 1958 and 1965 and this is much higher than the rate envisaged for overall energy consumption.

It is thus understandable why the state-owned enterprise, entrusted with very definite responsibilities for providing Italy's energy requirements, has entered into a whole series of activities both at home and abroad which, through the large-scale means employed and the solid footing on which they are based, provide well-founded hopes of success.

E.N.I. today is carrying out hydrocarbon exploration activities through its associated company AGIP Mineraria in Iran, Morocco, Somalia, the Sudan, Libya, Tunisia

Above left: This ENI well is unofficially reported a large producer in Iran's offshore area. The operating company is SIRIP, a joint venture with the government's NIOC.

Below: This camp is on top of the Zagros mountains, were ENI is drilling a difficult exploration well. From the rugged terrain it looks almost as if it would be easier to go down to the bottom of the mountain and drill horizontally.

Enrico Mattei was born April 24th, 1906 in the Italian town of Acqualagna in Pesaro province, a region famed for its rugged individuals. He began his career as an "operario" or ordinary workman and, after some time spent in Germany, began a factory in Italy for the manufacture of chemical products for tanneries and the textile industry. Following the Armistice in 1943 he took an active part in the Partisan movement, organizing the Catholic Partisan Group and was a member of the Military Committee for Northern Italy. He was later appointed representative of the "Volunteers for Liberty Corps" at the general headquarters of the Christian Democratic Party. The United States government awarded him the Bronze Star for his work during the war. He was elected to the Italian Chamber of Deputies during 1948 to 1953.

In May, 1945, the government appointed him special commissioner of AGIP for northern Italy and, in 1953, when ENI was founded, chairman of the board of ENI. In February 1960 he was again elected to this post for a three-year term. Within the ENI group, Mr. Mattei is managing director of AGIP. He is also chairman of AGIP Mineraria, AGIP Nucleare, SNAM, ANIC, SAIPEM, STANIC, I.E.O.C., and O.I.

Among his other positions is that of chairman of the Italian Federation of Volunteers for Liberty; Chairman of the National Association of Christian Partisans; chairman of the Committee for New Churches of the Dioceses of Milano; chairman of the Marche Regional Club and of the Center for the Development of the Marche Region; and chairman of the Research Laboratory for Oils and Fats. Among his honorary degrees is a Honoris Causa degree in mining engineering, University of Torino, 1953; Honoris Causa degree in Chemical Engineering, University of Bologna 1958; Honoris Causa degree in chemistry, University of Camerino. He is a Member of the "Cavalieri del Lavoro," an honorary title for outstanding achievement in industrial activities.

and Egypt. In the latter country COPE—in which AGIP Mineraria holds an interest through its shareholding in IEOC—is developing some oil fields in the Sinai peninsula. Production in these fields is at present going on at a rate of roughly 2 million tons per annum (40,000 barrels daily) and is scheduled to increase in the next few years.

In several of these foreign concessions, most of them obtained just recently, exploration operations have reached an advanced stage. In Iran, drilling is taking place in the Zagros mountains and offshore in the Persian Gulf. Results in the latter seem particularly promising. Exploration drilling is going on in Somalia, Egypt and Morocco.

At the same time as E.N.I. is so actively carrying out its exploration work, it is also engaged on several new enterprises both in Italy and abroad to do with transportation, processing and petroleum products distribution. These will enable it, through a higher degree of integration, to strengthen its independence on the oil market.

The E.N.I. Group's expansion program abroad is directed towards Europe as well as Africa and the Near East where oil consumption has risen very rapidly.

In Europe E.N.I.'s program revolves around the construction of a new oil pipeline network (with an annual capacity of 12 to 14 million tons of crude and fuel oil) leading from Italian ports to Switzerland and Southern Germany.

This undertaking—to which will later be added other projects in the refining field and in the road distribution network sector in Central Europe—was inspired by the following considerations:

a) the high consumption rate of petroleum products in Central Europe;

b) the expediency of replacing the traditional means of transport by large-diameter pipelines in view of the size of consumption

c) the fact that Italian ports are better placed than the North Sea ports for carrying oil to Central European consumption areas;

d) the possibility of using the oil pipelines leading into Central Europe also for supplying northern Italy where oil consumption has reached such a high level as to make pipeline transport an economic proposition.

The logical outcome of building the oil pipeline will be the construction of refineries in Switzerland and Germany. In Switzerland E.N.I. has already secured one third of the refining capacity in the future refinery at Aigle to be built by Société Raffineries du Rhone, which will have an overall capacity of about 2 million tons per annum and be supplied through the E.N.I. pipeline. In Germany agreements are now being drawn up for the construction of two large refineries.

Finally E.N.I. has formed its own companies for running petroleum products distribution networks in Switzerland, Germany and Austria.

Outside Europe E.N.I.'s work in the refining and petroleum products distribution fields consists in the construction—begun in May 1960—of a 1.3 million tons per annum refinery at Mohammedia in Morocco together with local interests. It also consists in an agreement signed with the Tunisian Government in August 1960 for building a million tons refinery, probably at the port of La Skirra, and in the formation of companies to distribute petroleum products through the roadway net-works in Morocco, Tunisia and the Sudan which will take their place side by side with the companies already operating similar networks in Somalia, Ethiopia and Libya, and distributing liquefied petroleum gas in the Middle East Countries. Finally, E.N.I. Group companies are carrying out the design and erection of oil installations and drilling equipment abroad as contractors.

Among some of the chief works either completed or still under way are: the construction of the Zarqa refinery in Jordan for the Jordan Petroleum Refinery Co. and of the Mohammedia refinery in Morocco for Samir (the company formed jointly by the Moroccan Government and E.N.I.); the drilling of 600 oil wells in Argentina for the state-owned corporation Yacimientos Petrolíferos Fiscales; the construction of liquefied gas bottling plants in Saudi Arabia; and the design and laying of natural gas pipelines in Pakistan, Iran and India.

Started only a few years ago, the E.N.I. Group's expanding activities abroad have already achieved some outstanding results and are arousing wide interest in international oil circles. I believe that a great deal of the merit for this success must be attributed to the new forms of intervention applied by E.N.I. in the international market.

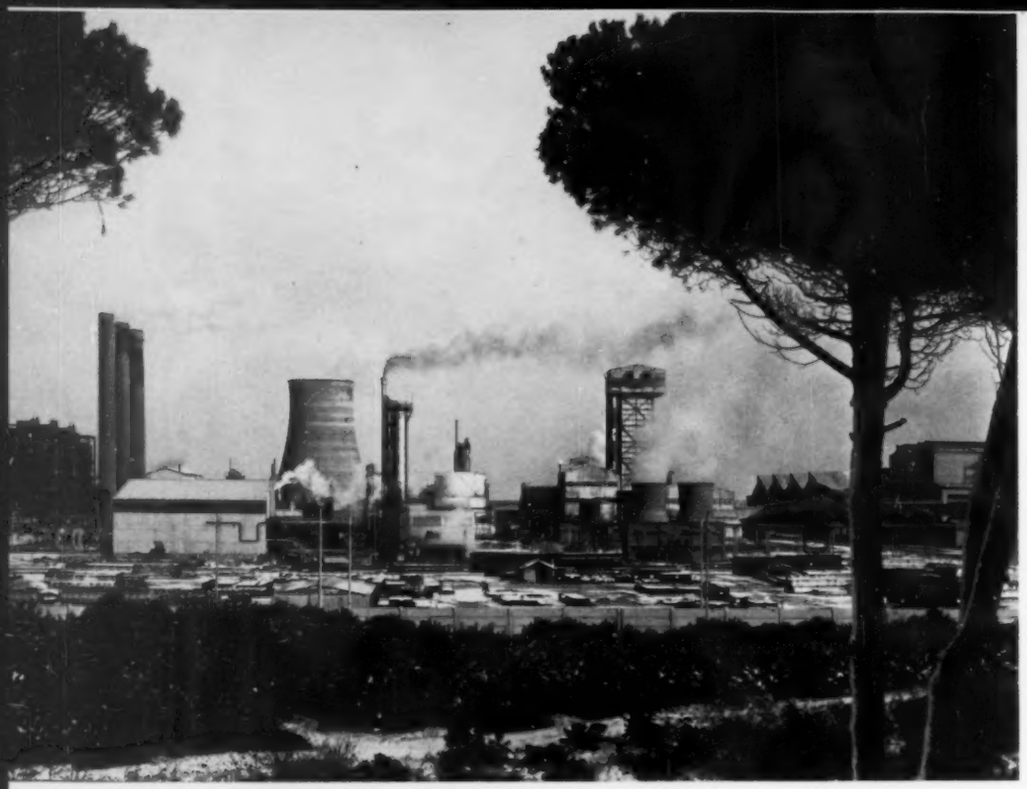
The Italian corporation's line of action does not follow the lines laid down by the major international companies which, even when they are under government control, have nevertheless shaped their activities to fit in with private enterprise's conception of making utmost profits for the company. On the contrary, it constitutes an instrument through which a policy of economic development, beneficial to the whole country, can effectively be carried out. The readiness with which E.N.I. recently followed the lower crude oil prices on the international markets with substantial reductions in the price of its own products on the home market gives a clear example of the part E.N.I. is playing in helping to increase energy consumption. By this action E.N.I. did in fact force its competitors to bring down their prices into line with the new ones and also provided the government—noting the upward trend of consumption re-

Enrico Mattei fishes occasionally in less troubled waters than the Persian Gulf. He is shown here in a moment of relaxation at his favorite sport.

Above: ENI has built this holiday village at Corte de Cadore in the Dolomite Mountains for the use of Group employees. About 150 chalets, furnished to accommodate family groups, is contained.

Left: Morocco operations of AGIP Mineraria, part of the ENI Group. Oil exploration is being carried out in the southern part of Morocco, province of Tarfaya through a mixed company, SOMIP, in which the state of Morocco has half interest.

Below: Pipe such as this forms part of the Russian exchange. This equipment is produced by Nuovo Pignone, saved by ENI from the brink of bankruptcy a few years ago and now a large engineering works.



A view of the ANIC plant at Ravenna, part of ENI Group. It produces petrochemicals.

sulting from the new prices—with an incentive to lighten the relative tax burden.

The spirit infusing E.N.I.'s activities has also brought about a new basis for relationships with the countries owning oil reserves. In securing its oil exploration rights abroad E.N.I. has not only offered the countries concerned better contractual conditions than usual but has also offered them the chance of taking part, with absolute equality of rights, in exploiting their own resources to the full and thus in developing their own economies.

This fresh outlook of E.N.I.'s accepts the realities of the new political situation created by the emergence of the underdeveloped countries from their state of political subjection into one of independence.

From this aspect I consider E.N.I.'s formula not so much as a means for a company to penetrate into some of the most sought after oil-bearing regions, but rather as an initial step forward to more lasting relationships between oil producing and oil consuming countries.

A change in these relationships has been going on for some time now. For one thing, development schemes financed from oil revenue are nowadays altering the pattern of the economy in the under-developed countries possessing oil reserves and are thus hastening the progress of internal and international relationships. A wider knowledge of modern techniques is increasing the people's confidence in their own abilities, an awareness of their problems and responsibilities, and their trust in the state's functions. Carrying this process to its ultimate conclusion involved a crisis in the old concession systems and the creation of new solutions turning the "grantor" states into "producers" and giving them direct responsibility for utilizing their own resources.

On the other hand the European countries—which in the next few years will have to count more and more on oil for supplying their growing energy requirements—are inescapably being led to play a more active part than before in obtaining their oil supplies.

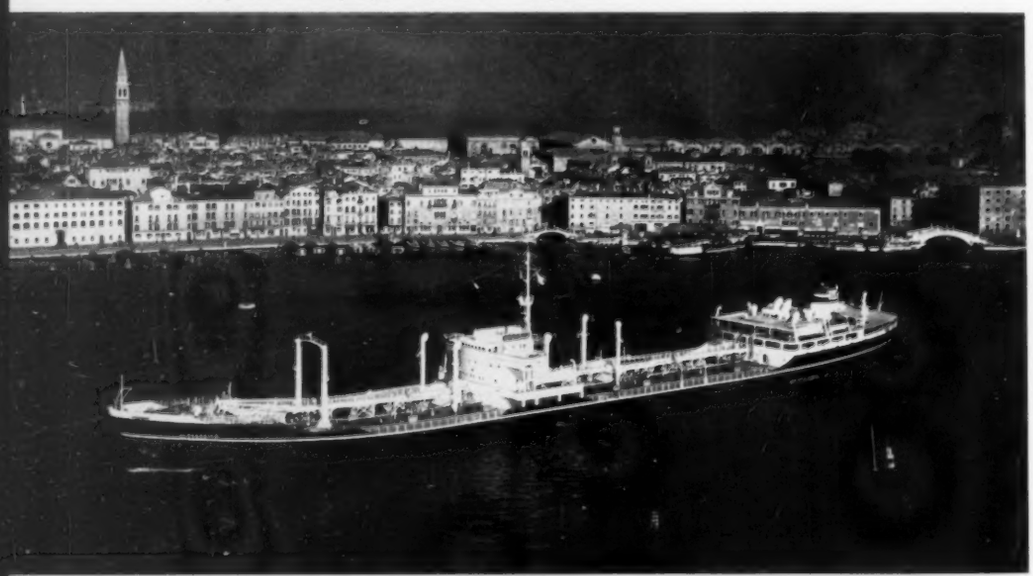
As the ultimate responsibility for oil operations passes gradually over to the state, whether producer or consumer, it is the states themselves which are becoming the real protagonists and, as the chances of a compromise of interests within the framework of the agreement between the major international companies fade, favorable circumstances are being created for setting up a new system based on co-operation between producer and consumer nations.

I feel that co-operation of this kind could lead to a much more orderly development of the petroleum market where price reductions—both possible and essential for European market development—are not the result of uninhibited competition leading to past investment being partially nullified and to the waste of present financial resources, but the outcome of common action between the interested parties. Such action should ensure that reductions in crude oil prices are accompanied by a rapid expansion in the market and this could be achieved partly through an appropriate reduction in the ex-refinery price of the products and partly through alleviating the tax burden which consumer countries place on petroleum products in general and motor fuels in particular.

In this way the producer nations' interest in having an adequate steady flow of income would be safeguarded at the same time as the consumer countries' interest in utilizing on advantageous terms much larger amounts of oil than they do at present.

Furthermore, a revision of the clauses governing the development of oil fields by foreign companies, particularly as concerns the actual participation of the states owning the oil reserves in the activities involved, would meet these states' legitimate need to play their part and exercise a control, and would also set off their loss of profits per unit arising out of the reduction in crude oil prices. In this way, while the producer countries would be absolutely sure that their economic development would not be jeopardized by the oil market's new set-up, it would be possible to avoid unilateral decisions benefiting one side only. END

Part of ENI's tanker fleet, which totals about 290,000 dwt.



Soviet oil threatens the Middle East

by Emile Bustani

Does Russian oil pose a major threat to international oil markets? Emile Bustani, well-known exponent of the Middle East viewpoint and a successful Lebanese businessman, believes it does. He says, in a forthcoming book, that Russia is prepared to deprive its own people (if not its industry) in an all-out drive to capture the Middle East's oil markets; markets which will provide Russian with the foreign exchange she so desperately needs for international purchases. This article has been extracted by Mr. Bustani from his forthcoming book, March Arabesque, which will be published this Spring in London by Robert Hale Co.

RUSSIA DOES NOT need Arab oil for her own purposes, but it is clear that nothing would please her better than to possess the means of denying it to the West in certain circumstances. Hence her courting of the Arab world, her sometimes brilliant exploitation of the force of Arab nationalism, and her repetitive offers of aid and trade 'without strings.' Her cold war activities in the Middle East present a continual danger to the interests of the Western oil companies. It is not, however, realized as widely as it should be that her own oil production may come to present an equal danger to the interests of the Arab oil-producing and transit countries, the 'haves' and the 'have-nots' alike. Statistics may prove everything and nothing, but they sometimes show an ominous red light. Consider the following.

In 1959, oil production in the Middle East amounted to nearly 232 million metric tons. Broken down into separate countries, the figures were these:

	Metric Tons
Kuwait	69,533,000
Saudi Arabia	54,162,000
Iran	45,630,000
Iraq	41,730,000
Qatar	7,993,000
Neutral Zone	6,510,000
United Arab Republic	3,760,000
Bahrain	2,253,000
Turkey	372,000
	231,943,000

During the same year, the USSR produced 129 million metric tons of oil, an increase of more than fivefold since the end of the war. (Middle East oil has increased sixfold in the same period.) Under Russia's current seven-year plan, oil production is scheduled to reach 230 million to 240 million metric tons by 1965—almost double the 1959 figure. And Mr. Krushchev himself has declared that Soviet oil output will achieve an annual level of 350 million to 400 million tons by 1972. As for oil reserves, the Societ Minister for Geology, Mr. Antropov, assured a press conference in Moscow, in the autumn of 1958, that the largely untapped areas in the Soviet Central Asian Republics of Turkmenistan and Uzbekistan contained as much oil and natural gas as the whole of the Arab world and Iran combined.

As is well known, Soviet spokesmen tend to be optimistic—sometimes to the point of delirium—when speaking of future achievements pledged under Communism. And Soviet statisticians are sometimes more sanguine than accurate in compiling prodigal records of past output. Nevertheless, there is no reason to doubt that Russia's oil production is expanding on a very considerable scale, and every reason to fear—when one considers her chronic shortage of foreign currency—that she will ultimately turn into an oil-exporting State of the first magnitude. Certainly, her own oil needs are immense, but she is well able to meet them. Future output will provide her with an ever-increasing surplus which she is only too likely to offer for sale to the world. Indeed, she has already made attempts to peddle oil in the European market at cut rates.

Russian Aims Revealed: At the Second Arab Oil Conference, held in Beirut in October 1960, the chief Soviet delegate, Mr. E. P. Gurov, made it clear that Russia had every intention of exploiting the European oil market in every way possible. As he put it, she was only seeking to restore her oil exports to the level they occupied before the second world war. In 1933, he said, the USSR produced 19% of the oil imported by Western European countries, whereas in 1959 she produced only 10% of the total. "We do not," Mr. Gurov declared, "encroach upon the market to the detriment of the historical positions of other suppliers" (which brought a pretty hollow laugh from the Arab delegates present) "we are only renewing our legal place among the exploiting countries."

Russia's action may be legal, but undercutting a traditionally Arab oil market can hardly be regarded as a friendly gesture towards the Arabs. It has, as a matter of fact, already led directly to reductions in the price of Arab crude oil (imposed by the oil companies with no prior reference to the Arab oil-producing states) with obvious bad effects on the Arab economy.

If the Soviet Union possessed a surplus of oil at the present time her dumping tactics would be at least understandable. But no country can logically be said to possess a surplus of oil when the material standards of its people are inadequate. Published statistics show that there were no more than 124,500 private cars in the USSR in 1959—which, with a population of 213 million, works out at one car to every two thousand people. In the United States there are 60 million private cars among a population of 170 million, or almost one car to every three human beings. Russia, who makes so large a show of helping under-developed countries, would do well to remember that development, like charity, starts at home, and devote her oil supplies to the material advancement of her own people.

(*Continued on page 68*)

Libyan turnbacks watched

THE BAR in the Uaddan Hotel in Tripoli, Libya, is the scene of some high priced guessing these days. Concession surrenders are underway, as the initial period for the original concessionaires comes to an end, and the havenots are warily eyeing the 25% parcels that are being relinquished by the haves, trying to put together a concession that will add up to an oil find. Recent discoveries such as the Esso discovery during December on their EL-20 in the joint venture with Libam (Libyan American) have stimulated interest. Shell has a recent discovery also in B1-41 well, which tested about 140 b/d. High pressure gas halted work for the time being, while evaluation work is going forward prior to giving up part of their concessions.

The accompanying map shows the areas to be relinquished. Over 20 companies are following events closely, many of them in combinations that will permit them to offer higher bonus payments and more extensive marketing outlets. No grants on the surrendered areas are expected immediately. The government is expected to act on applications in March or May.

THE LIBYAN PETROLEUM LAW*

Law No. 25 of 1955 and Amendments Thereto. There are three provisions in Libya—Tripolitania, Cyrenaica and the Fezzan. These three provinces are divided into four petroleum zones. The first zone consists of the province of Tripolitania. The second zone consists of the province of Tripolitania. The second zone consists of that part of the province of Cyrenaica which lies north of the 28th parallel of latitude. The third zone consists of that part of the province of Cyrenaica which lies south of the 28th parallel of latitude. The fourth zone shall consist of the province of the Fezzan.

There are different regulations for the various zones because of their accessibility to the sea and transportation.

Permits

Eligible Applicants: The Petroleum Commission shall consider applications for permits or concessions submitted by eligible applicants only. When determining the eligibility of an applicant the Commission shall consider the following points: a) the applicant's compliance with relevant laws and regulations; b) the applicant's previous activity in the petroleum industry; c) the applicant's previous experience in the conduct of similar operations; d) the applicant's financial and technical capacity to conduct the contemplated operation.

In the event an applicant is a subsidiary of a company or a member of a group of companies, the possession of the aforesaid qualifications by the parent company or the group of companies of which the applicant is a member shall be taken into consideration.

Application For Permits: The company is authorized to carry out preliminary exploration for petroleum on the following conditions: 1) a fee of Libyan £500 ($1,400.00) must accompany each application; 2) a permit must be obtained in each province where work is carried out; 3) the term of a permit is for one year; 4) within thirty days after the termination of the period of one year, the company shall submit to the Director of the Petroleum Commission a report containing a description of the work done. All reports shall be treated as confidential; 5) this permit entitles the permitee to carry out surface geological reconnaissance, aerial surveys and surface geophysical operations; 6) this permit does not allow the permitee to drill wells, mechanical core drilling or seismic operations; 7) the permit holder shall not impede in any way the works of any concession holder, or enter into prospecting of development sites without the permission of the concession holder; 8) this permit cannot be assigned without the written consent of the Commission.

This permit does not give the permit holder any rights whatsoever to any petroleum, nor does it give the permit holder any rights or priority to a concession. However, a permit must be applied for either before or at the same time as a concession if applied for.

Concessions

Eligible Applicants: The Commission shall consider applications for concessions submitted by eligible applicants only. When determining the eligibility of an applicant the Commission shall have regard to the following: a) the furtherance of the public interest; b) the applicant's compliance with relevant laws and regulations; c) the applicant's previous activities in the petroleum industry; d) the applicant's previous experience in the conduct of similar operations; e) the applicant's financial and technical capacity to conduct the contemplated operations.

In determining the eligibility of an applicant which is a subsidiary of a company or a member of a group of companies there shall be taken into consideration the possession of the aforesaid qualifications by the parent company or the group of companies of which the applicant is a member and the extent of the availability to the applicant of such qualifications.

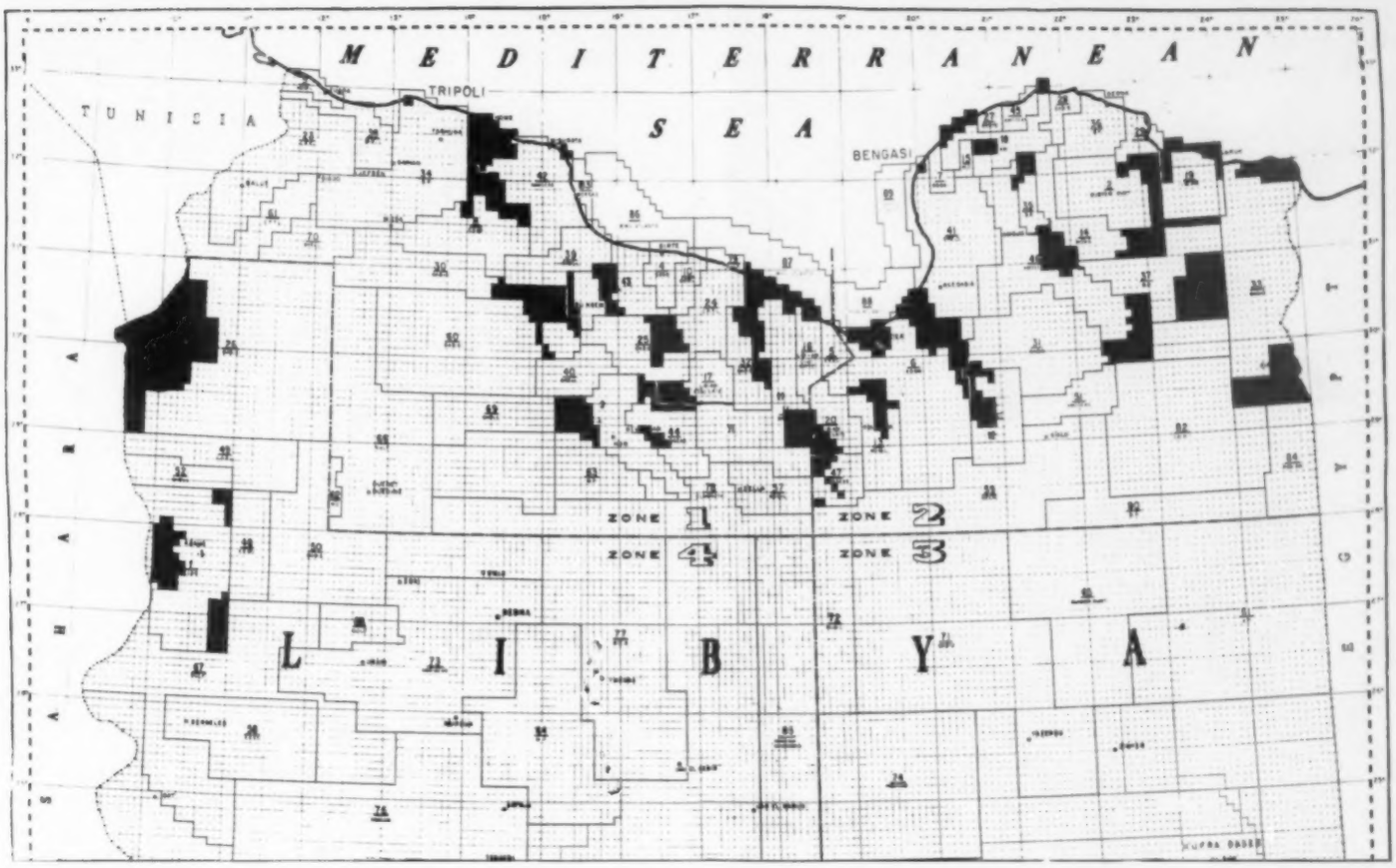
Application for Concessions: Applications for concessions are to be submitted in triplicate to the Petroleum Commission and should disclose the following: 1) names of the directors of the company and the address of the head office; 2) a statement of its past activities in the petroleum industry; 3) its balance sheet for the past five years (where possible); 4) the program of work it intends to carry out on the concession area; 5) a Power of Attorney for its representative in Libya; 6) a statement that it does not carry out any business directly or indirectly in Israel; 7) the Articles of Association of the company; 8) a Certificate of Incorporation and that the company is not in a state of liquidation or winding up; 9) in the case of subsidiary companies, an undertaking by the parent company making its financial and technical capacity available to its subsidiary; 10) the applicant must give a banker's guarantee in the sum of Libyan £50,000 ($140,000.00) and undertake to abstain from all political activities of Libya. This fifty thousand pounds is a performance bond.

Period and Area of Concessions: Concessions shall be granted for the period of time requested by the applicant provided that such period shall not exceed fifty years. A concession may be renewed for any period provided the total of the two periods does not exceed sixty years.

The maximum number of concessions and the total areas which may be held at any one time is as follows: 1) three concessions in each of the first and second zones and four concessions in each of the third and fourth zones. The Commission has the power to grant further concessions if they see fit; 2) no concession in which there is an oil or gas well capable of producing in commercial quantities shall be included in computing the number of concessions held by any one company; 3) the maximum area of a concession shall be 30,000 square kilometers (7,413,000 acres) in each of the first and second zones and 80,000 square kilometers (19,768,000 acres) in the third and fourth zones.

Rentals and Fees: The concession holder shall, in respect of each concession granted hereunder, pay: a) a fee of Libyan £500 ($1,400.00) upon the granting of each concession; b) surface rents for each 100 square kilometers (24,710 acres) held shall be: (i) for concessions located within the first and second zones, Libyan £10 ($28.00) for each of the first eight years, Libyan £20

* This review of Libyan oil law requirements has been prepared by B. D. Gothard, former division landman for Seaboard Oil and now associated with a Libyan company which is registered as petroleum advisors and consultants for North Africa. He and his wife are now residing in Tripoli, Libya.



LIBYAN CONCESSION HOLDERS
(Black areas surrendered in 1960)

Concession No.	Date Granted
Oasis Oil Co. of Libya	
25	12 Dec. 1955
26	" " "
27	" " "
28	" " "
29	" " "
30	" " "
31	" " "
32	" " "
33	" " "
59	22 Dec. 1955
60	26 Jan. 1957
71	10 Dec. 1957
B. P. Exploration Co. Libya) Ltd.	
34	28 Jan. 1956
35	" " "
36	" " "
37	" " "
63	14 July 1957
64	" " "
80	5 Sept. 1959
81	" " "
American Overseas Petroleum Lt.	
42	31 Dec. 1955
43	" " "
44	" " "
45	" " "
46	" " "
47	" " "
51	2 May 1956
73	10 Nov. 1957
83	6 Dec. 1959

Concession No.	Date Granted
Esso Standard (Libya) Inc.	
1	20 Nov. 1955
3	12 Dec. 1955
4	" " "
5	" " "
6	" " "
7	" " "
8	" " "
48	2 May 1956
58	11 Dec. 1956
Pan American Libya Oil Co.	
74	17 Mar. 1958
76	" " "
84	10 Dec. 1959
Mobil Oil of Canada Ltd.	
9	31 Dec. 1955
10	" " "
11	" " "
12	" " "
13	" " "
14	" " "
15	" " "
50	2 May 1956
57	26 Jan. 1957
62	20 Feb. 1957
72	18 Dec. 1957
Gulf Oil Co. of Libya	
66	8 April 1957
67	" " "
68	" " "
79	22 Aug. 1959

Concession No.	Date Granted
Libya—Shell N. V.	
38	11 Jan. 1956
39	" " "
40	" " "
41	" " "
52	15 Dec. 1956
69	10 Dec. 1957
70	" " "
Nelson Bunker Hunt Oil Co.	
2	20 Nov. 1955
65	18 Dec. 1957
Deutsche Erdol Aktiengesellschaft	
77	14 Aug. 1958
Campagnie Petroles Total Libye	
23	31 Dec. 1955
24	" " "
49	2 May 1956
61	4 Mar. 1957
Compagnia Ricerche Idrocarburi	
82	19 Nov. 1959
Libyan American Oil Co.	
16	12 Dec. 1955
17	" " "
18	" " "
19	" " "
20	" " "
Elwerath Oil Co. Libya	
78	2 June 1959

($56.00) for each of the next seven years or until petroleum is found in commercial quantities, whichever is the earlier; and Libyan £2,500 ($7,000.00) for each year thereafter; (ii) for concessions located within the third and fourth zones, Libyan £5 ($14.00) for each of the first eight years. Libyan £10 ($28.00) for each of the next seven years or until petroleum is found in commercial quantities, whichever is the earlier, and Libyan £2,500 ($7,000.00) for each year thereafter.

Work Obligations: The holder of any concession shall within eight months commence operations to explore for petroleum within the concession area. The company shall spend not less than the following sums on said operations, including general organizational overheads and administrative expenses connected therewith: a) in respect of all concessions in the first and second zones. during the first five years at the average rate and over the total area held in the zone, of Libyan £1.500 ($4.20) per square kilometer (247.1 acres) per annum; during the next three years at the average rate over the period and over the total area held in the zone, of Libyan £3.500 ($9.80) per square kilometer (247.1 acres) per annum and thereafter during each successive five-year period at the average rate over such period of Libyan £6 ($16.80) per square kilometer (247.1 acres) per annum; b) in respect of all concessions in the third and fourth zones; during the first eight years at the average rate over the period and over the total area held in the zone of Libyan £1.500 ($4.80) per square kilometer (247.1 acres) per annum. During the next four years at the average rate over the period and over the total area held in the zone of Libyan £3.500 ($9.80) per square kilometer (247.1 acres) per annum and thereafter during each successive five-year period at the average rate over such period of Libyan £6 ($16.80) per square kilometer (247.1 acres) per annum.

Any sum spent during any of the working periods in excess of the minimum sum shall be carried forward as a credit for the following period or periods.

If at the expiration of one-half of any period of the working periods it appears to the Commission that a concession holder has neglected his obligations, the Commission may require such holder to deliver to it a bond or banker's guarantee of the balance of his expenditure obligation unfilled in that zone. Such guarantee may, at the end of the period, be forfeited to the extent the holder may have failed to fulfill his obligations.

It is now the established policy of the Commission not to grant a concession without a drilling commitment.

Royalty: Oil—The company shall pay a royalty of 12½% of production of all petroleum, excluding natural gas, after deduction of the quantities of such petroleum and natural gasoline used by the company in the course of its operations.

The value of crude oil shall be the average free competitive market price during the pervious quarter f.o.b. Libyan seaboard terminal of crude oil of the same or nearest comparable type, with such adjustments for quality and gravity, minus handling charges and cost of transportation from field storage.

Natural Gas: The company shall pay a royalty of 12½% on the sale price, less the cost of transport from the wellhead to the place of sale. The royalty on natural gas exported shall be based on the sale price at the point of sale after deducting handling charges, duties and imposts and cost of transportation from the wellhead.

Notwithstanding anything in the foregoing some companies have agreed to pay as high as 17% royalty instead of the normal 12½%. Some companies have also agreed to let the Libyan Government participate up to 30%. This, of course, was on an option basis so far as the Government is concerned.

This again shows that the Government is very flexible in its oil policy.

Assignments: The company may assign its concession, in whole or in part, to one or more companies if the assignee: a) controls the assignor, or; b) is controlled by one or more companies who themselves control the assignor.

In other cases assignments may not be made except with the consent of the Commission and subject to such conditions as may be deemed appropriate. The Commission is entitled to impose any conditions it deems fit before approving any assignment.

Reports: The company shall at its own expense furnish to the Director during the first quarter of eacht year a report on the progress of its operations in the concession area during the preceding year. This report shall contain: 1) A statement of the number and location of bore-holes and wells drilled, and their depths; 2) a statement of any oil or gas shown in any well, also water; 3) a statement of all oil and gas produced and sold; 4) the nature and extent of geological and geophysical surveys carried out; 5) a statement of the number of Libyans employed; 6) on the discovery of oil or gas, the Director must be notified immediately; 7) all information furnished shall be kept strictly confidential except with the consent in writing of the company.

Import and Export Duty: The company or any contractor employed by the company may import free of duty, plant, machinery, tools, equipment and materials together with such other goods as may be needed from time to time for exploration, exploitation, pipelines, refineries, et cetera, provided, however, that such exemptions shall not apply to any goods which are available in Libya of suitable type, quality and price.

Petroleum or any of its products produced in Libya and any goods imported free of duty may be exported free of duty and without an export license.

Surface Rights—Damage: The company shall have the right to enter and occupy free of charge for the purpose of its operations, land within its concession area other than private lands or lands that are occupied lawfully by another person.

Surface agreements with private landowners must be made by the company. If the amount of compensation cannot be agreed upon by the private owner and the company the Commission shall refer the dispute for determination by an appropriate Court of Law. The Commission will grant the company right of egress and ingress immediately providing the company puts up a reasonable deposit.

Depletion Allowance: Several different types of agreements have been made with the various companies by the Petroleum Commission.

In one instance it was agreed that the amount claimed as depletion should, within a specified period of time, be spent on exploration in the concession area. Exploration was strictly defined. Any amounts remaining unspent will revert back to net profits and will be divided equally with the Commission. Naturally, when exploration ceases no depletion can be claimed.

The second stage of development was to omit percentage depletion allowance entirely and to keep intact the cost depletion allowance. In other words, the Commission would at no time allow the concession holder to make more than a 50% net profit regardless of the depletion allowance.

This shows that the Commission is flexible in its oil policy. In the original regulation the concession holder was allowed a 25% depletion allowance.

Taxation and Division of Profits: The company shall pay such income tax and other taxes and imposts as are payable under the law of Libya but shall not be subject to any form of taxation as to render it liable to taxation or other dues not payable by companies in general operating in Libya, other than fees, royalties and surface rents payable under the concession and the law.

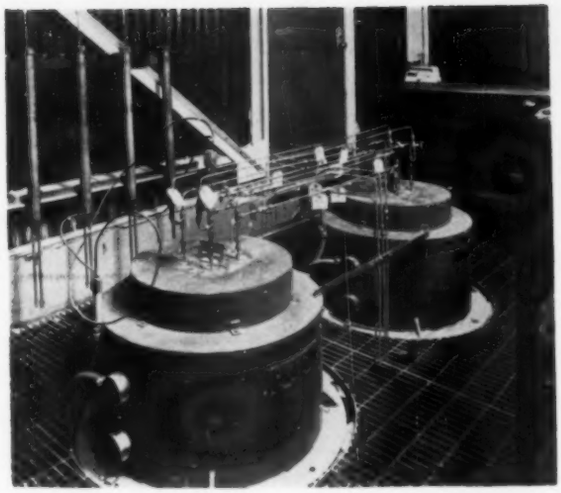
If in respect of any complete year the total amount of fees, rents, royalties and income taxes for which the company is liable in respect of operations and income therefrom under all the concessions held by the company falls short of 50% of the net profits, the company shall pay to the Government such sum by way of surtax as will make the total equal to 50% of such profits.

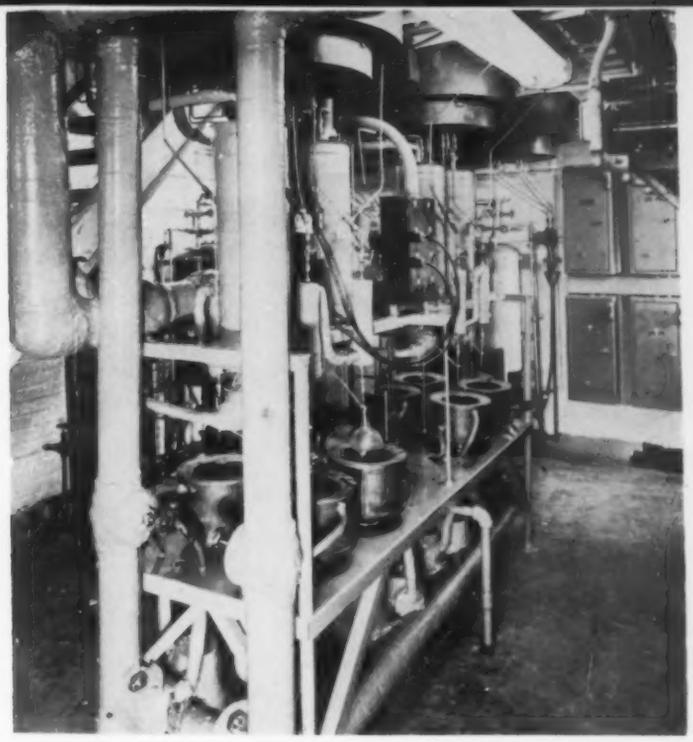
If in any year the total amount of the fees, rents, royalties, income tax and other taxes for which the company is liable, exceed 50% of net profits, it is entitled to deduct said excess in the following year or years.

Profits mean in respect of any year the income of the company from all of its petroleum activities, development, prospecting and producing activities in any one year, after deducting all expenses and losses, except fees, rents, royalties, income taxes and other taxes and imposts payable.

Exploration and prospecting expenses, intangible drilling costs, to the extent such expenses and costs are not incidental to the

(Continued on page 72)





Two photos show cracking furnaces used in catalyst testing service. View above is of furnaces suspended on grating, with details of piping to each reactor (four extra reactor tubes are hanging on rack in background). View at right shows bottoms of furnaces, water condensers, and liquid products collection flasks plus associated controls.

How catalyst test service aids Fluid unit operations

Operators of about half the Fluid catalytic cracking units in the USA and Canada are finding a relatively new catalyst testing service is paying them handsome dividends in better process performance.

Initiated on a very modest level some 10 years ago, the service consists of a program of periodic laboratory evaluations of the equilibrium catalyst in the Fluid units served by Davison Chemical Division, W. R. Grace & Co. It has grown today to a major undertaking involving about 80 Fluid units throughout North America.

Each month samples of used catalyst from these various Fluid units come in to Davison's laboratories at Curtis Bay, Md., for an intensive inspection. The study includes evaluation of all the chemical, physical, and catalytic properties which affect performance. From these data, Davison can also read something of the history of the use of the catalyst in a given unit, and can thereby advise the refiner if any changes in his operations might be indicated.

Under normal conditions, a preliminary laboratory report is sent to the refiner by telegram within four days of the time the sample reaches the Davison laboratory. Complete data are provided in a full report sent by airmail in about one week, along with chronological plots which show the historical trend of the major characteristics of the refiner's circulating catalyst. Davison bears the full expense of the program, which during 1960 ran in excess of $100,000. The company supplies pre-addressed shipping containers, tags to identify the sample, and tape to seal the containers.

The service is particularly valuable for the smaller refiner. It is in effect an adjunct to his own process control laboratory. He frequently cannot afford to equip and staff his laboratory to carry out an equivalent program, On the other hand, large refiners have also told Davison they use the service because its speed exceeds that which they can expect from their own laboratories.

What kind of problems are solved? What does the service do for the refiner? How does it benefit him? Here are some examples of what the service has done:

1—Reported promptly that the heavy metals content of the circulating catalyst had increased abruptly, indicating that a feed preparation unit was malfunctioning or that an unfavorable change in feed stock had been made.

2—Reported quickly that the fines content of the catalyst had suddenly dropped, pointing to either a broken dip-leg or perhaps a hole in the cyclone separator.

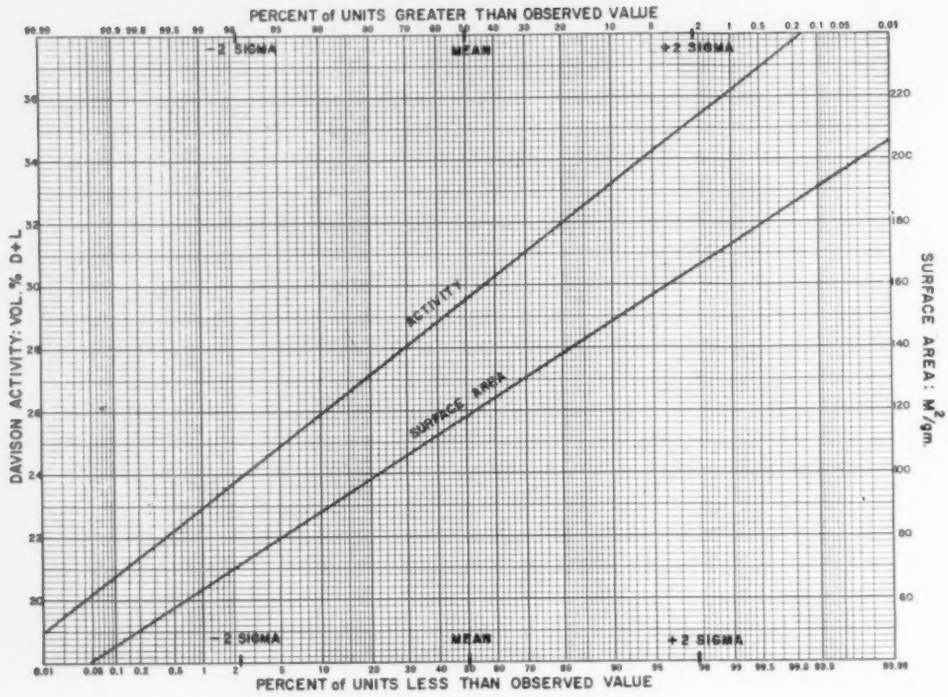
3—Reported a structural collapse in the catalyst, calling the refiner's attention to newly occurring high temperatures from plugged or eroded grids or perhaps a failure in the stripper.

Davison has found pay dirt in the program too. When and if serious difficulty does arise, it helps to have the historical background in terms of consistent data which then becomes a means for diagnosing exactly what did happen and when. Much

Table 1—Quality Trends in Equilibrium Fluid Cracking Catalysts

	Current Quarter		Previous Quarter		Year-Ago Quarter	
	Mean	Range*	Mean	Range*	Mean	Range*
Activity, D + L	29.6	23.9-35.3	28.8	23.7-33.9	30.5	24.7-36.3
Surface area, M^2/gm.	118	71-166	119	71-166	124	70-177
Metal Contamination:						
Vanadium, ppm.	201	43-935	203	46-887	260	55-1228
Nickel, ppm.	84	17-407	78	11-547	83	16-438
Copper, ppm.	4	0.4-40	4	0.4-40	3	0.3-35
Sodium, ppm.	564	96-3227	579	91-3701	482	89-2612
Iron, wt-%	0.37	0.11-1.28	0.36	0.11-1.22	0.34	0.10-1.14

*95% of Fluid units tested fall within these limits


PERCENT of UNITS GREATER THAN OBSERVED VALUE
99.99 99.9 99.8 99.5 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01
-2 SIGMA
MEAN
+2 SIGMA
DAVISON ACTIVITY: VOL. % D+L
SURFACE AREA: M²/gm.
ACTIVITY
SURFACE AREA
PERCENT of UNITS LESS THAN OBSERVED VALUE

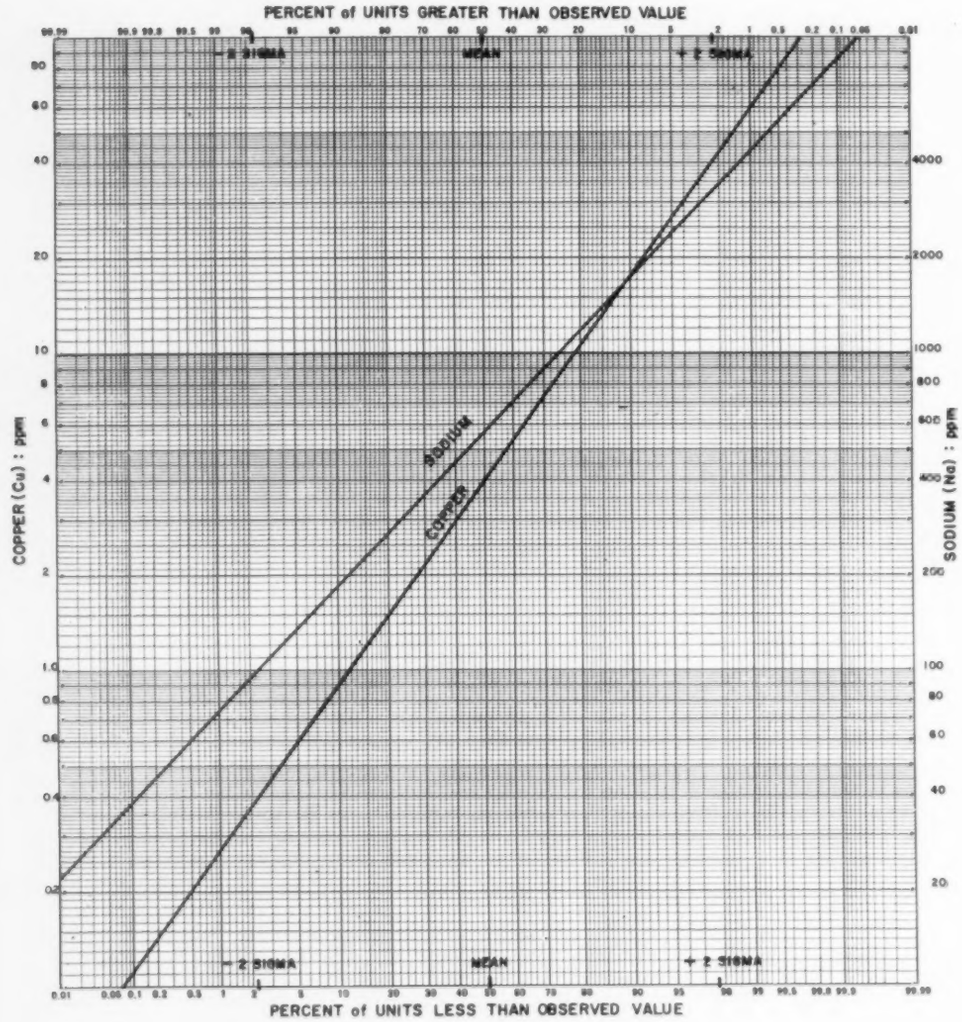


Fig. 1—Range of values for catalyst activity and surface area

of the value of the program lies in its scope; the experience gained from studying catalysts from some 79 units can all be brought to bear on the study of the 80th unit.

Throughout the program, the refiner is protected. All sources of information remain anonymous. It is the information rather than its source which is essential to the success of the program.

The catalyst properties tested as a normal routine usually include a complete particle size analysis, surface area, average pore volume, complete chemical analysis, and an evaluation of activity and selectivity.

About two years ago, Davison found that refiners would ask how they compared with other refiners. They wanted to know if they were high or low, and just what high or low was with respect to circulating catalyst activity and metals levels. It was impossible to provide any definite answer to the latter question, because each refiner has an operation peculiar to his own particular conditions. He has to determine himself the economic justification for operating with a quality higher or lower than others.

It was possible, however, to answer how the operations compared. Davison began tabulating and distributing to its customers for each annual quarter the mean value—and the range of values—for those properties which best define equilibrium catalyst quality for the USA and Canada. An example of the data is shown in Table 1. Three periods of time are reported; the current quarter, the preceding quarter, and the year-ago quarter. The average values were determined by averaging all relevant analyses during the quarter under consideration.

Surface areas are obtained by the standard B. E. T. nitrogen adsorption method. Metal contaminants are measured by standard chemical procedures. Catalyst activity is by the Davison D+L method, a variation of the Jersey D+L test. It is basically the measure of the vol-% of liquid product boiling below 400 F obtained by cracking a standard East Texas gas oil over the catalyst being tested at standard operating conditions.

The ranges indicated for each property are necessarily broad, because they include 95% of the participating units in the USA and Canada, and they therefore encompass a great variety of feed stocks and local operating requirements.

It was found at the start of this program that no appreciable change occurred in activity or surface area during the preceding year, nor were there any seasonal operational changes indicated. The vanadium,

Fig. 2—Range of values for sodium and copper content, in ppm

nickel, and copper contaminants had decreased slightly, over the preceding year, but the iron and sodium had increased.

The overall effect indicated by these changes was believed to be the combined effects of decreased fresh catalyst consumption (constant activity and higher iron and sodium levels), and improved cracking unit feed quality (lower vanadium, nickel, and copper in the face of lowered fresh catalyst consumption).

Davison emphasizes that the data is not presented with the implication that the mean values are necessarily the most desirable levels of operation. The wide ranges reported are good evidence that all refiners cannot operate at the mean values. On the other hand, the data do provide a true reflection of trends in Fluid unit operations.

About six months after the quarterly tabulating system was started, Davison added a graphical presentation from which each refiner could evaluate his own situation more precisely. See the accompanying charts in Figs. 1, 2, and 3.

To understand these graphs, their mathematical basis must first be explained. When Davison analyzed all their equilibrium catalyst data before issuing the first set of quarterly tables, they found that the type of frequency distribution was not the same for each property. Specifically, the surface area and activity data fell into a "normal" statistical distribution, whereas all the chemical property data indicated the existence of a skewed distribution. This in itself was not surprising, because metal contaminants are kept deliberately to a minimum, which means in mathematical terms that they approach zero as a limit. For this reason, the frequency distribution curves of the metals analyses reduce to the normal curve only when the logarithm of the value is used. It was therefore decided that all the chemical analyses could be represented by "log-normal" distributions.

To represent the calculated data graphically in a form for maximum ease of use, the frequency distribution curves have been transposed onto either arithmetic-probability coordinates or logarithmic-probability coordinates, depending on the particular property. Using these coordinates, the actual distributions of the data from all the units under the test program can then be plotted as straight lines.

As an example in the use of the graphs, assume that the equilibrium catalyst of Refiner "X" contains, for a recent quarter, 300 ppm of vanadium as the metal. Using the appropriate graph, and reading from 300 ppm on the ordinate to the curve and then to the upper abcissa, it is found that 30% of the units tested had a vanadium level greater than that observed by Refiner "X." Using the lower abcissa, it is also determined that 70% of the units tested had a vanadium content less than that observed for Refiner "X."

Furthermore, the graph shows that 50% of all the units tested were using equilibrium catalyst with vanadium levels greater than

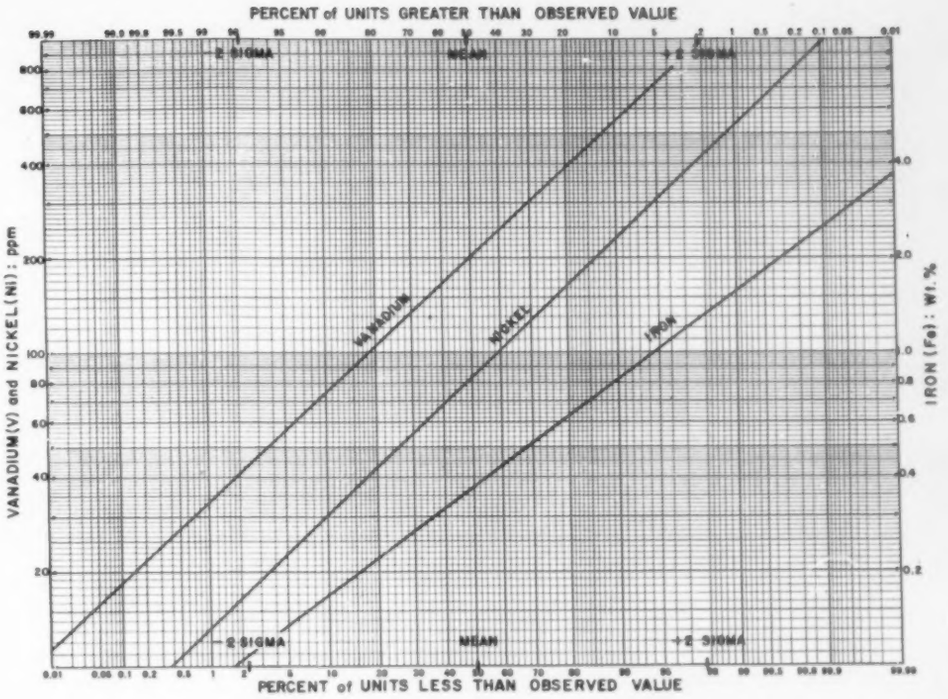


Fig. 3—Range of values for vanadium and nickel content, in ppm, and for iron content, in wt—%

201 ppm, which corresponds to the mean reported in the table. The range for vanadium, shown again in the table as 43-935 ppm, represents approximately 95% of all the Fluid units tested, and these values can be found on the graph at the ± 2 Sigma intercepts of the abcissa.

Note that in Table 1 no past history is shown for pore volume and apparent bulk density. Data on these properties have been added to the tabulation recently in response to a number of requests, and are to be continued.

The equilibrium catalyst testing service is not restricted to the USA and Canada, although the bulk of the program has thus far been centered in these areas. Davison offers the service in the Eastern Hemisphere through its working arrangement with Joseph Crosfield & Sons Ltd., the chemical affiliate of Unilever Ltd. which manufactures catalyst at Warrington, England, under license from Davison, for the United Kingdom and other markets outside the USA and Canada.

Davison utilizes catalyst testing as an integral and important part of its overall technical services program. F. Emerson Ivey, Jr., manager of the technical service department, cited several examples of how their overall technical service program assists refiners.

1. The activity maintenance in one plant was increased by 4 units while the daily fresh catalyst addition was being reduced from 10 to 2.5 tons.

2. A plant which had suffered from abnormal stack losses for years was found to have the trickle valves on the cyclone legs located in a turbulent section of the catalyst bed.

3. A unit using twice the normal amount of fresh catalyst in order to maintain catalyst inventory was found to have a poorly located differential pressure meter, resulting in a very high catalyst bed level which overloaded the cyclone separators.

4. An optimum combination of catalyst particle size distribution and attrition-resistance was found to meet the needs of a unit with unique design characteristics. As a result, the catalyst consumption was reduced to an all-time low.

5. A unit using a natural catalyst was limited in throughput because of very high hydrogen production. The use of a new catalyst reduced this hydrogen production, restored throughput, and increased activity level, all at an actual savings in daily catalyst requirement.

The company is quick to point out that it is not true that the catalyst is never at fault when a Fluid unit meets with operational problems. No two units are completely alike, and it is obviously impossible to supply tailor-made catalyst for each plant. Furthermore, through the years, refiners in general have been subjecting their catalyst to increasingly more severe conditions as they push their units well beyond original design levels. Regenerators run hotter, gas velocities are higher, conversion levels are increased. Thus, there will inevitably be cases in which the catalyst and the Fluid unit become incompatible. It is at that point where the supplier must recognize that a new catalyst has to be found or developed which will meet the requirements. The so-called "high stability" catalyst announced recently (see WORLD PETROLEUM, Oct. 1959, pp 54-57) was developed under just such a situation. END

Tropical heat on a drilling rig requires the proper costume. This drilling crew is working in the rainforests of Gabon, where the French company Ste. des Pétroles d'AEF has established production (Photo by André Martin, Paris).

Oil—new Africa and old concessions

by Karol N. Gess*

The 17 new African states which attained independence by the end of 1960 are faced with the problem of old concession agreements for oil and other minerals. Should these agreements, granted while the former colonial power was in control, be honored by the new governments? The answer is yes, as a general rule; the new States honor such previously-acquired rights. New grants must run the gamut of conditions laid down by the independent nation itself, however.

THE PRESENT ARTICLE is a preliminary assessment of the status of mining and petroleum concessions in Africa in the light of the far-reaching political changes which have taken place on that continent in the course of the past months.

By the end of 1960, seventeen African states, all of them south of the Sahara, had attained full sovereignty and independence in the course of the year.[1] In at least six of these states there are major foreign minerals concessions which had originally been granted by the respective former colonial powers. To what extent then are the new states bound by these earlier concessions on their territories and what, if any, are the modifications or adaptation to which such concessions have been subject since the states concerned attained independence? (These concession agreements are available from *Petroleum Legislation*, Post Office Box 1591, Grand Central Station, New York 17, New York).

While both questions will be examined in some detail below, it is true to say in summary that the new states are at least initially bound by the existing concession agreements. These have always been promulgated locally by decree or other legislative or executive measure and the binding effect of which measures on the new states is, in turn, affirmed in the various constitutional instruments of a majority of the new African states. These instruments say, in essence, that all existing laws and executive measures shall remain in force unless specifically modified or abrogated by the legislature of the succeeding state. Such changes in the legislative structure of concession regimes as have taken place so far have always provided for safeguards for existing concessions, and one of the underlying principles has been respect for acquired rights.

The Republic of the Congo: The Basic Law of the Republic of the Congo (capital at Leopoldville) provides that the laws, decrees and legislative ordinances, their implementing measures, as well as all regulations in effect on June 30, 1960, when the Congo attained independence, are to remain in force in the absence of specific abrogation.[2]

While existing concessions have so far not been subject to any modifications, there have been major changes in the basic structure of the concessionary regime. While the Congo was under Belgian rule, three semi-public corporations held, under government grant, large tracts of land. Their rights included, among others, the granting of mineral exploration and exploitation permits

*Mr. Gess is a consultant specializing in overseas investment and concession legislation.

[1] The new states in question are: (a) *Former French territories:* Republics of Chad, Congo (formerly Middle-Congo, capital at Brazzavile), Dahomey, Gabon, Ivory Coast, Mali (formerly French Sudan), Mauritania, Niger, Senegal, the Central African Republic (formerly Ubangi-Shari), the Malagasy Republic (formerly Madagascar), as well as the Republic of Cameroun and the Togolese Republic, both former Trust Territories under French administration. The Republic of Guinea elected independence in 1958. (b) *Former Belgian territories:* Republic of the Congo (capital at Leopoldville). (c) *Former British territories:* Federation of Nigeria. (d) *Former territories under Italian trusteeship:* Somalia (Somaliland).

[2] Loi fondamentale relative aux structures du Congo, Title I, Article 2, *Moniteur* Belge, Nos. 127-128, 27 and 28 May 1960, 3988.

and concessions against payment of royalties. In these matters the corporations were entirely substituted for the government of the colony and acted as autonomous bodies. The three corporations in question were the Comité Spécial du Katanga, which had acquired its rights in 1900 from the independent state of the Congo (of which the King of the Belgians was the sovereign), the Comité National du Kivu, and the Compagnie des Chemins de Fer du Congo Superieur aux Grands Lacs Africains, usually known by the initials C.F.L. The special rights of the corporations were to expire in 1990 in the case of the Comité Spécial du Katanga and in 2011 in the case of the other two corporations. An element of inter-relation existed between two of the corporations inasmuch as the Comité National du Kivu held certain grants of right from the C.F.L.

In May 1960, the Belgian government decided to put the government-to-be of the Congo in a position of disposing freely of the country's resources from the outset of its existence as an independent state. It accordingly withdrew the concession-granting powers of the Comité National du Kivu in favor of the colony or of the C.F.L., as appropriate, against compensation, under the terms of a convention dated May 25, 1960, approved by decree of May 30, 1960.[3] By a subsequent convention,[4] the C.F.L.'s rights, in turn, reverted to the Republic of the Congo, which had by that time come into being. As regards the rights of the Comité Spécial du Katanga, these were terminated by the government of Katanga as of September 1, 1960. No details on this action have so far become available, but it is understood that in this case, as in those mentioned above, the acquired rights of concessionaires are to be respected and existing concessions are not affected.

According to reports in the Belgian press, the compensation payable to the Comité National du Kivu was fixed at 170 million Belgian francs ($3.4 million) and that payable to the Comité Spécial du Katanga at 350 million Belgian francs ($5 million).

Under the terms of the convention between the Belgian Congo, the Comité National du Kivu and the C.F.L., concluded just before the Congo's attainment of independence, the government of the colony was substituted for the Comité National in all existing concession contracts relating to areas held by the latter, and the provisions of the colony's minerals legislation became applicable to such contracts, acquired rights being protected. A 3% surcharge on royalties in favor of the Comité national was abolished.

As regards the current situation with respect to grants of new prospecting and mining concessions—the term including the extraction of mineral fuels—a basic change in regulations attendant on the country's attainment of independence is in the allocation of concession-granting powers to the provincial governments, though these governments are bound to act within the policy regulations laid down by the central government.[5] The Basic Law provides, however, that mining concessions are to be granted within the framework of existing legislation, adding that the provinces shall participate directly and equitably in any revenue obtained from royalty and similar charges.[6]

Former French Territories: Two considerations that are primarily of a political nature have played an important part in ensuring an element of stability in the concessionary regimes of the former French African colonies: the French policy of giving the territorial legislatures considerable powers relating to the approval of prospecting permits and mining concessions (the latter terms also covering petroleum and other combustible substances) and the wide international interests which have participated in the major minerals exploration and exploitation ventures in a number of the French territories. The first of these points has made for quite wide local participation in the decision to grant a given permit or concession, giving considerable satisfaction to the desire for self-determination. The second point has tended to attenuate the continued economics "presence" of the former colonial power—a point of some importance in countries whose separation from France came about amicably, but under the impetus of strong nationalist movements.

The constitutions of virtually all of the new African states which had formerly been French territories provide for the continuance in force of all earlier laws and administrative regulations in the absence of any specific modification or abrogation under conditions set forth in the constitutional instrument concerned. Provisions to this effect are to be found, for instance, in the constitutions of the republics of the Congo (Brazzaville) (Constitutional Law No. 1, Article 12), Chad (Title XI, Article 60), Dahomey (Title XIII, Article 58), Gabon (Title XIII, Article 48), Mali (Title X, Article 52), Mauritania (Title IX, Article 53), Senegal (Title V, Article 48), and the Central African Republic (Title IX, Article 45).[7]

As a matter of general practice, major concession agreements have been re-submitted to the newly-constituted government authorities whenever there has been an important change in the territory's status, as, for instance, in 1958-59, when the French Overseas Territories were given the option of leaving the French Union or remaining within the Union—or the French Community, as it then became known—as autonomous entities. *The Republic of Gabon* illustrates the transition process of a single complex of concessions in the light of the territory's transformation from a colonial territory to a sovereign state. Petroleum exploitation operations in the Gabon were begun some years ago by the Société des Pétroles de l'Afrique Équatoriale Francaise (S.P.A.E.F.) in which the French government was heavily represented. The preesnt review is, however, concerned with the transition process in relation to another minerals concession—that of the Compagnie Miniére des l'Ogooué (COMILOG), established to exploit extensive high-grade manganese deposits in the Franceville area in the interior of Gabon. This company's succeeding concessions are presented here as being typical of other concessions in the minerals field as a whole throughout former French Africa.

COMILOG was founded in 1953 with a share capital distributed as follows: United States Steel Corp. and subsidiary, 49%; Cie. des Minerais de Fer Magnétique de Mokta-el-Hadid, 14%; Soc. Auxiliaire de

(*Continued on page 76*)

What does it say? To most Nigerians the oil industry is mystery wrapped an enigma, as to this tribesman watching a Mobil International Co. exploration technician at work. There is a growing labor force for petroleum in the country, however, and those with sufficient educational background are being trained for technical and higher positions.

[3] *Moniteur Congolais*, No. 23, June 6, 1960, 1965.

[4] Not yet available.

[5] Loi fondamentale, Title V, Articles 219 and 220.

[6] *Ibid.*, Articles 223 and 224.

[7] *Journal officiel de la Communauté*, No. 5, June 15, 1960, 46-89.

Skimming pond was formed by a dam in a natural ravine. In background is the 3500-ft approach trestle to the marine jetty

Milford Haven, newest refinery in the UK, now onstream

by Cecil W. Wood
European Editor

Dedicated late last year, Esso Petroleum's latest plant, a 100,000 b/sd facility, represents capital investment of £56,000 per worker

THE NEW MILFORD HAVEN refinery of Esso Petroleum Co. in Pembrokeshire, formally inaugurated by the Duke of Edinburgh in November, is situated in one of the most beautiful parts of Wales, on the edge of what Lord Nelson described as one of the finest harbors in the world.

Probably in no other "grass roots" refinery in the world has a company given as much attention to the protection of local amenities as to refinery design and construction as Esso has done here. Its chairman, Hugh C. Tett, said at the opening:

"Britain is such a small island that there is inevitably some price to be paid for industrial expansion, but right from the start we have tried to reduce to the minimum our impact on a wonderful coastline. What success we have had in tucking ourselves away into the contours of the land is largely due to the imaginative advice given us by our landscape consultant, Mr. S. Colwyn Foulkes; and I hope you will also observe how our architects, Sir Percy Thomas and Son, have incorporated traditional Welsh materials into the modern design of the permanent buildings."

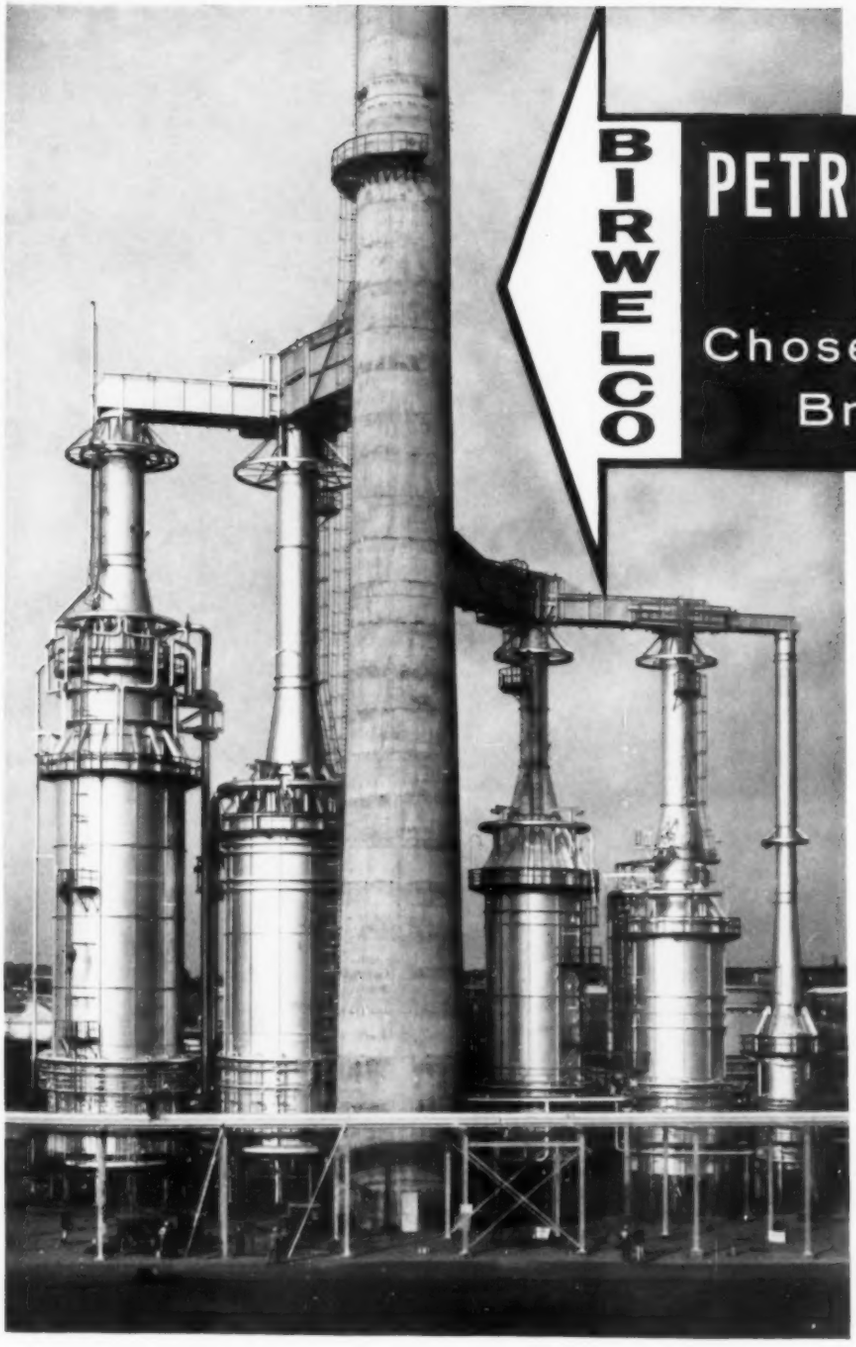
All who have seen this refinery must agree that the way in which it is terraced on the folds of the falling ground has proved highly successful, particularly when viewed from the water in the Haven. It is an example of "social engineering" at its best. From the land, the refinery will in time be even more screened as the trees recommended by the Forestry Commission grow in size.

This £18.5 million plant with a capacity of 4.5 million tons/yr (100,000 b/sd), represents a capital investment of some £56,000 for each member of what Mr. Tett described as "this local family of 330 people." Nearly all are local workers, many of them specially trained to help in founding a new industry for Pembrokeshire—and one that will be run by Pembrokeshire people. Additional staff will be brought in as required for periodical special maintenance.

This is the first UK refinery to be entirely aircooled, a feature considered of great importance from the Haven anti-pollution aspect. Coolers are of the forced-draft type, with either fixed or variable pitch fans and blades of aluminum or steel with an epoxy resin coating. Coolers which have pedestal mounted electric drives were supplied by Spiro-Gills Ltd.

Another feature is the very high degree of automation. Milford Haven is claimed to be one of the most highly automated in Europe. All process control units are integrated into one central control room requiring only four men. Other automatic control centers govern processing, utilities and oil movement. Tanks under Customs control have averaging resistance thermometers and electronic-type automatic gages, while the remainder have float-type automatic gages. At the time of the inauguration, the control rooms were manned by a staff of 16 men.

Over 99% of all materials used in construction are of British manufacture or origin. A quarter million tons of steel refinery equipment, valued at about £6 million, were brought to the site, some 600,000 cubic yards of earth were moved to form terraces for plant, and 7½ miles of roads had to be laid. Though 98-99% of products are expected to move out by sea, the plant its linked to the main railway for the



BIRWELCO

PETROCHEM-ISOFLOW FURNACES

Chosen for NEW Esso British Refinery

All the Powerformer and Hydrofiner furnaces for the new Esso refinery at Milford Haven, S. Wales, G.B., were designed and supplied by the British manufacturers of Petrochem-Isoflow Equipment, Birwelco Ltd.

This is one of the two largest recent furnace contracts in Europe, both carried out by Birwelco Ltd.

THE INSTALLATION INCLUDES:

- ★ **A POWERFORMER CHARGE HEATER AND REHEATER.**
- ★ **STABILIZER REBOILER AND FLUE GAS HEATERS.**
- ★ **TWO FURNACES FOR THE HYDROFINER UNIT.**

The largest furnace has a heat liberation of approximately 160 million B.T.U.'s per hour.

Petrochem-Isoflow Furnaces are manufactured for any capacity, duty or service, and specifically designed for special purposes. They are engineered and manufactured by BIRWELCO ltd., in Great Britain and other parts of the world, under licence from the Petrochem Division of Yuba Consolidated Industries Inc., U.S.A.

EVERY PETROCHEM-ISOFLOW FURNACE IS SPECIFICALLY GUARANTEED FOR THERMAL PERFORMANCE.

More than 2,500 Petrochem-Isoflow installations throughout the world have set world standards in design, low cost, ease of maintenance and EFFICIENCY.

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Cables: Birwelco, Birmingham

Esso

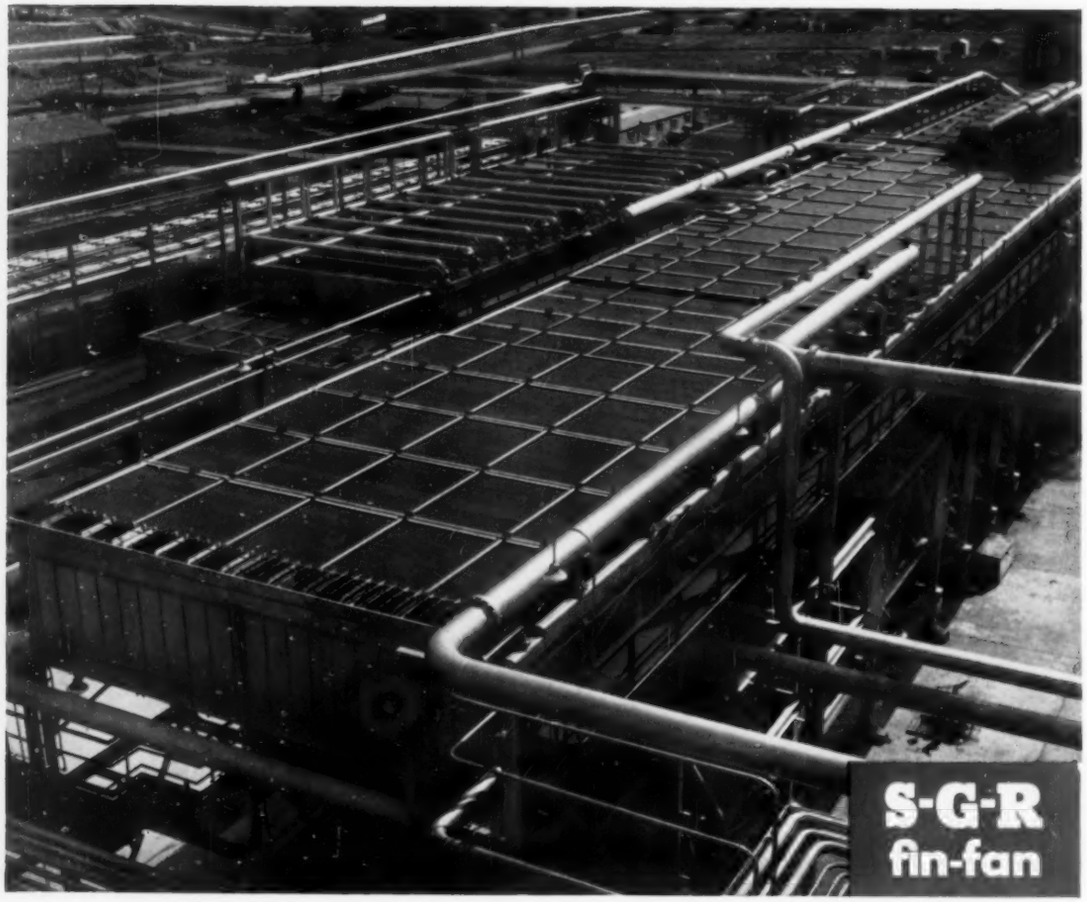
achieve efficient cooling with

200 miles of air-cooled finned tubes

13½ million cubic feet of cooling air per minute

2½ million square feet of cooling surface

Heat exchange 650 million B.Th.U.'s per hour



All the air-cooled heat exchangers at the Milford Haven Esso Refinery are manufactured by **SPIRO-GILLS LIMITED**

PULBOROUGH, SUSSEX. 'PHONE PULborough 2401/5

in association with THE GRISCOM-RUSSELL CO., Massillon, Ohio, U.S.A., for the Esso Petroleum Company Ltd. Main contractors: Foster Wheeler Ltd.

General view of Esso Petroleum's new £18.5 million refinery at Milford Haven, with the marine jetty in background

small proportion of direct inland deliveries.

The principal contractors for this project were Foster Wheeler Ltd. (main contractors for the refinery proper), George Wimpey & Co. Ltd. (site grading and buildings), John Mowlem & Co. Ltd. (marine terminal), while Whessoe Ltd., Wm. Neill & Son (St. Helens) Ltd. and Motherwell Bridge & Engineering Co. Ltd. were jointly responsible for tankage.

At the inauguration Mr. Tett said the job was entrusted to Foster Wheeler "because of their great experience; because they came to us as tried friends from building our Fawley refinery. There was a third reason—they made substantially the lowest bid."

The list of suppliers of equipment numbers some 170 firms and only a few can be mentioned here: Babcock & Wilcox Ltd.; British Ermeto Corp. Ltd.; British Oxygen Co. Ltd.; Peter Brotherwood Ltd.; Burton Delingpole & Co. Ltd.; The Cape Asbestos Co. Ltd.; Dawson & Downie Ltd.; Elliott Bros. (London) Ltd.; The English Electric Co. Ltd.; Evershed & Vignoles Ltd.; Fibreglass Ltd.; Harland & Wolff Ltd.; Imperial Chemical Industries Paint Division; The London & Midland Steel Scaffolding Co. Ltd.; Metaducts Ltd.; Newman, Hender & Co. Ltd.; The Oil Well Engineering Co. Ltd.; Wm. Press & Son Ltd.; The Pyrene Co. Ltd.; A. Reyrolle & Co. Ltd.; Rubery Owen & Co. Ltd.; Ruston & Hornsby Ltd.; Sydney Smith & Sons (Nottingham) Ltd.; South Durham Steel & Iron Co. Ltd.; Stewarts & Lloyds Ltd.; and Wood Bros & Co. (Gaskets) Ltd.

Milford Haven consists essentially of four process units: the primary crude oil atmospheric distillation and light-ends recovery unit; the Powerformer for converting low octane naphtha into high octane gasoline; copper sweetening unit for removing unwanted compounds from gasoline and jet fuel; and the Hydrofiner for removing sulfur from gas and diesel oils.

The distillation unit is designed to process 100,000 b/sd of Middle East crudes, with three basic types of operation to enable a wide variety of cuts to be obtained. Its column has four sections—three fractionating and one stripping—and this throughput is the largest for any single distillation unit in the UK. The Foster Wheeler furnace, with a heat release of about 465 million Btu/hr from 52 burners, shares the distinction, with an identical counterpart in Rotterdam, of being one of the largest in the world.

Two streams in parallel, for processing light and heavy virgin naphtha respectively, are treated in the copper chloride unit. The light naphtha stream has a capacity of 7,800 b/d from the light ends section, and the heavy naphtha stream can handle four feeds, the maximum being 14,900 b/d from the pipestill. To eliminate risk of pollution, the spent caustic soda wash is discharged far out at sea by tanker.

The 16,500 b/sd Hydrofiner depends on the pipestill for its feed and the Powerformer for its treat gas. However, a Hydrofiner shutdown does not affect the operation of the other two units. Also incorporated is a high sulfur gas oil drier, which allows high sulfur gas oil from the pipestill to be dried, having bypassed the Hydrofiner. The Hydrofiner product drier can also be utilized for this service should the Hydrofiner be shut down.

The catalytic reformer is based on the Esso Model II semi-regenerative Powerformer and is designed to reform 14,900 b/cd of light and heavy naphtha blends.

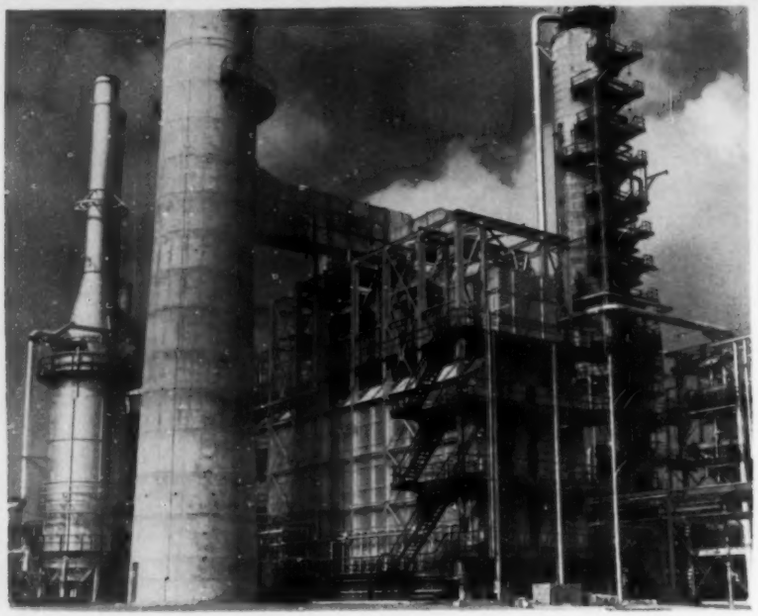
Three grades of Esso gasoline are produced by an in-line blending system. The continuous leading system, employing the weigh tank method of control, was supplied as a package unit by The Associated Ethyl Co. Ltd.

For blending heavy fuel bottoms with light gas oil a specially designed in-line unit was supplied by Fisher Governor Co. This firm also supplied nearly 200 automatic control valves and 39 "Level-Trol" liquid level controllers in a wide range of sizes. The fuel blending unit differs from the standard Fisher unit used in many refineries in that the balancing unit is designed to ensure that a product line is never shut off completely.

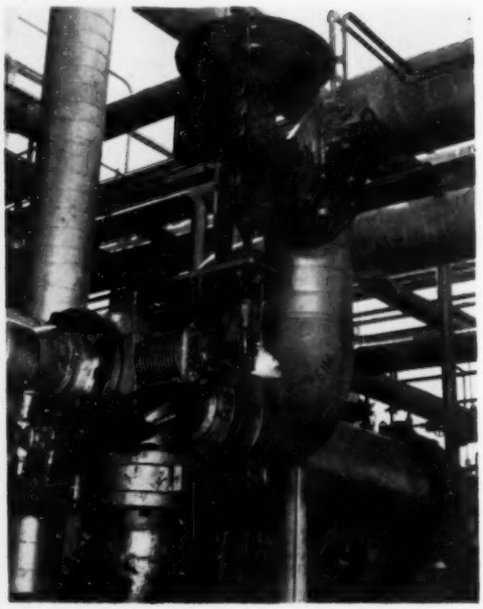
Crude for 39 days' operational supply is provided for by nine floating pontoon roof tanks with 1.5 million barrels capacity. Each is 150-ft. diameter by 54-ft. high fitted with two, 25-hp, side-entry mixers supplied by L. A. Mitchell, Ltd., to ensure uniform feed to the crude unit. Mixers are installed as low as possible and roofs are recessed locally so that they can be lowered within 18 inches of tank bottoms.

Crude tanks have diversion instead of the conventional walls. Thus spillage is directed, via a normal API separator, into an impounding skimming reservoir which also collects storm water from the refinery and the small amount of cooling waste. This reservoir has been cleverly formed by damming a natural ravine near the shore of the Haven. Clean water is discharged through a 48-in. line into the Haven which is always submerged. In the event of a crude tank failure the oil would be diverted into the skimming pond and an oil/water interface control would close the effluent water outlet.

There are 23 intermediate tanks and 27 for product storage, with several horizontal



Pipestill furnace at Milford Haven, with a heat output of 465 million Btu/hr, is one of the largest in the world



Close-up view of a Fisher Governor three-way butterfly valve in heat exchanger by-pass service

Milford Haven crude unit, at left, with the Powerformer at the right, and aircoolers in the foreground

drums for 10,000 barrels of propane and four spheres for LPG. The total storage provided (excluding utility tanks) is over 5 million barrels.

Compressed air facilities comprise four Alley & McLellan reciprocating units delivering a combined total of 4,500 SCFW at 125 psig: three are electric motor driven and one has steam turbine drive.

Tanks were located to minimize the length of interconnecting piping runs within the limits of orderly layout and the landscaping requirements. Over 65 miles of pipe, in diameters ranging from ½-in to 18-in, were made by Stewarts & Lloyds Ltd., valued at £140,000. Most was to API:5L and seamless, but there were also small amounts to API:106, and a 36,500-ft length of 4-in welded tube made on the electric resistance weld mill. S & L also supplied over 500 tons of fabricated pipework valued at £100,000.

A short ground flare of the multi-jet type designed to burn 15 mmscf/d with a smokeless and non-luminous flame takes the place of the very tall flare-stack common to refineries—a further protection to the beauty of the area.

There are few natural harbors in Britain other than Milford Haven where it is possible to handle 100,000-ton tankers with safety at almost any state of the tide. The marine terminal at the 9 to 10-fathom mark, built by John Mowlem & Co., was a major undertaking costing £2 million, as the Haven has a 52-ft high water tide and a 26-ft tidal range.

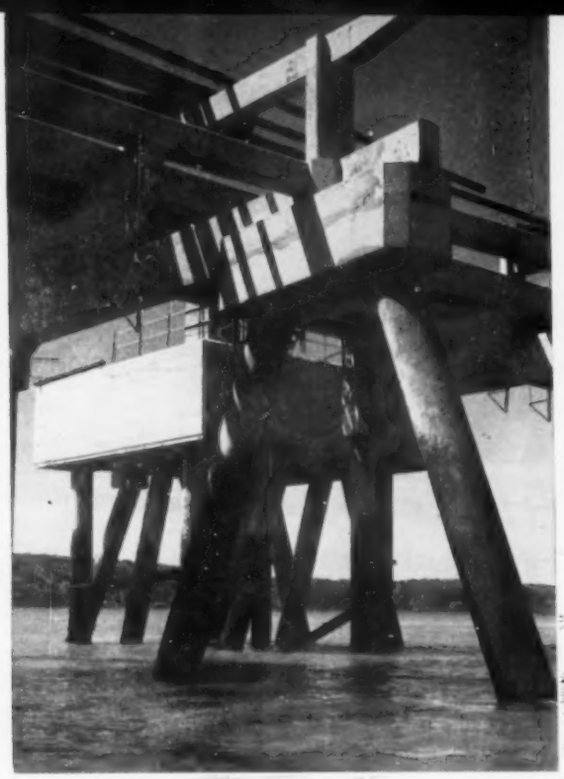
It consists of a 3,500-ft long approach jetty terminating in a 2,600-ft Tee-head. In addition to two outside berths for tankers up to 100,000 dwt, there is an inner berth for coastal tankers up to 5,000 dwt. Fenders are provided which are designed to absorb the impact of loaded vessels up to 135,000 tons gross. Of the contractors, Mr. Tett said at the inauguration: "They brought to this job novel methods, including the manufacture on the site of prestressed concrete piles in 500-foot lengths—a unique achievement."

Esso Petroleum has three 77,000-ton tankers building, the first being due for delivery next October.

Only 375 of the 1,200 acres owned by the company are so far developed and there is ample room for expansion, even allowing for that part of the property lying within a protected National Park. Land not now used for the refinery continues to be farmed.

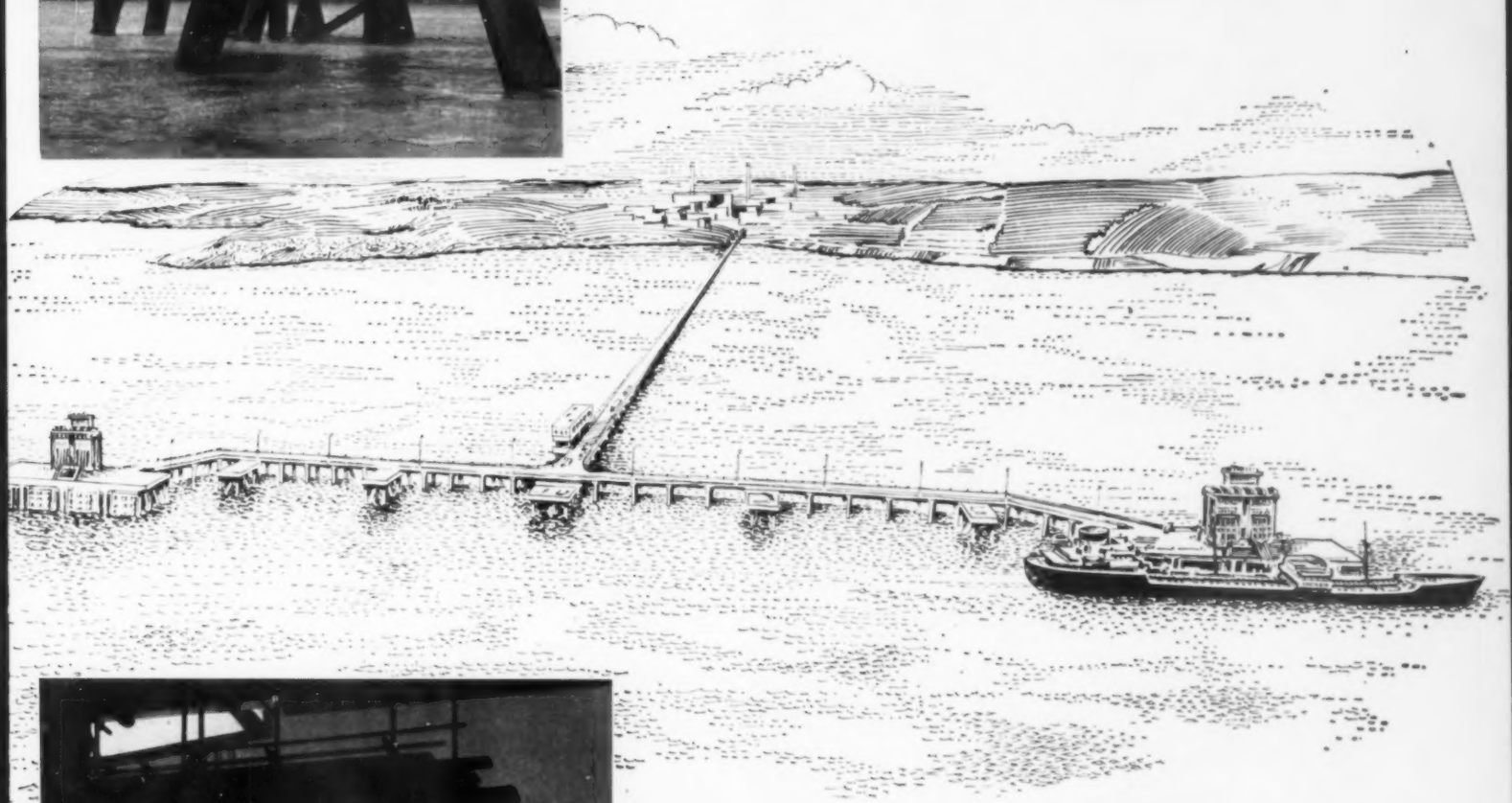
It is anticipated that initial refinery capacity will be adequate for five years but it is felt to be beyond question that eventually further plant will be added. It is recognized however that its isolation from large markets may be an important factor in encouraging the building of petrochemical plants based of refinery feedstocks.

Milford Haven refinery may or may not become another Fawley. But at least it is a welcome addition to the industrial economy of Wales apart from its value to the UK processing potential, and in effecting this Esso Petroleum has fulfilled its policy of "good neighborliness" admirably. END



MOWLEM and Milford Haven

In the deep water of Milford Haven Mowlems have just finished the second of two berths to take the world's largest tankers at the Esso Petroleum Company's oil terminal. They are connected with the shore by a jetty three-quarters of a mile long.



Mowlems designed both berths and jetty; and they were ready to start construction within 5 months of the first inquiry.

Construction started in July 1958; it was completed September 1960.

The longest (143 ft) pre-stressed concrete piles ever used in Britain were designed by Mowlems for Milford Haven (see photo at top). 10-ton hammers on 95-ft high piling frames mounted in Mowlems' own vessels were used to drive them.

JOHN MOWLEM & CO. LTD
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THE OLD—the Salzbergen plant in 1900 already 40 years old at that time

100 years of refining in Salzbergen, Germany

WHEN THE SALZBERGEN, Germany, refinery of Wintershall A.G. celebrated its 100th birthday last year, it marked more than just a company's anniversary. There are only a very few refineries in the world which started operating around the year 1860 and are still working.

Salzbergen made its debut in 1860 as the German/Dutch owned "Paraffin und Photogenfabrik Salzbergen," just a year after the Drake well found oil near Titusville, Pennsylvania. The Salzbergen plant started with the processing of oil shale which was found in great abundance just a few feet below the surface in that general area, in Western Germany near the Dutch border and about 80 miles from the North Sea Coast.

The shale, containing approximately 4% oil, was crushed, dried, and loaded into retorts measuring about 8 ft long and 2½ ft high. It was subjected to sufficient temperature to vaporize, and the vapors flowed

THE NEW—the Salzbergen refinery in 1960, showing main process and storage areas

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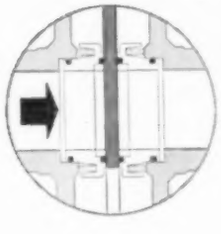

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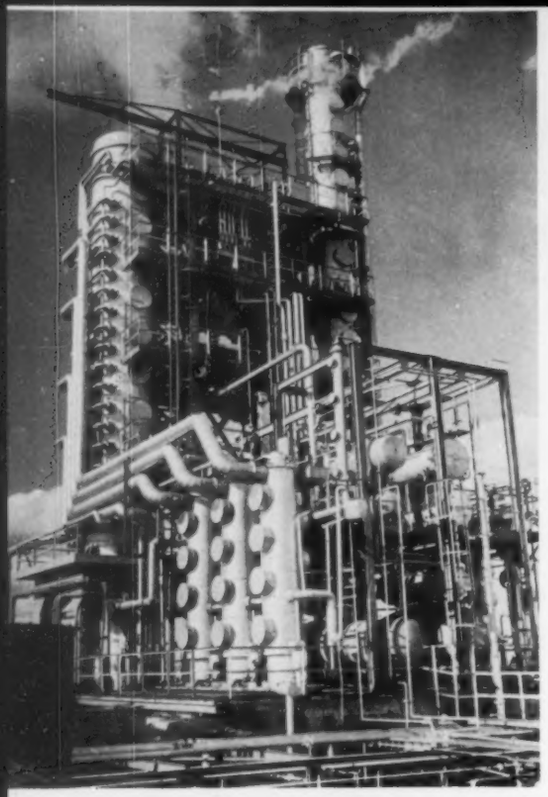
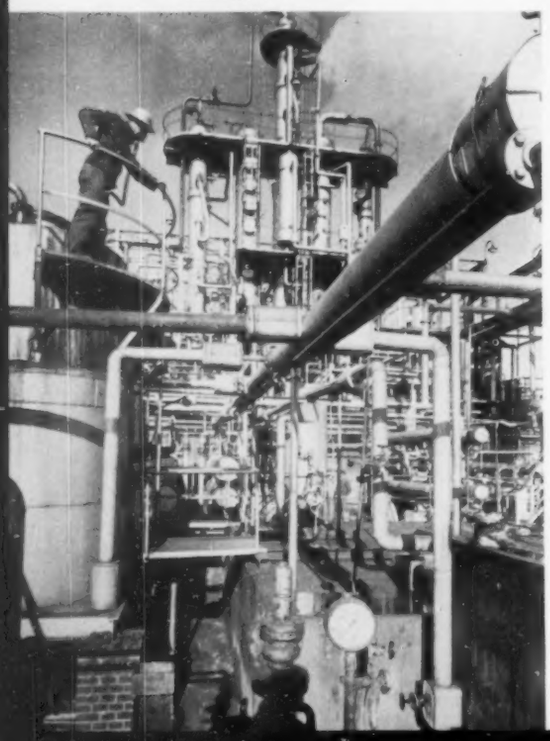


Two-stage crude distillation unit at the 2,300 b/d refinery of Wintershall A.G. in Salzbergen. Photos by Dr. Paul Wolff & Tritschler OHG.

to a separator vessel from which the oil was recovered. Product was used primarily as an illuminant. Inasmuch as one barrel of the finished product commanded a price of 100 marks, it was far from being a lucrative business due to the high maintenance costs and the frequent burning out of vessel bottoms. The capacity of these early retorts at Salzbergen was 1-1/3 b/d.

Dr. Wilheim Heinrich Lepenau, who supervised production at that time, eventually acquired the business and immedately began a search for a raw material with a higher yield. His search resulted in the importation of crude oils from America in 1862.

Solvent recovery at the dewaxing plant at Salzbergen



At this time kerosine as well as various lubricants which virtually eliminated the demand for vegetable and animal lubricants were being marketed in increasing quantities. The old retorts were quickly replaced with refining units from which wax was also recovered. A great number of products and the development of non-competitive lubricating oils soon made the Salzbergen refinery well known and forced a continual expansion of its manufacturing facilities.

Toward the year 1880 Salzbergen also imported Russian crude oil from Baku, which was better processed because of its cold performance. When in 1880 the first profitable crude oil fields in Germany were discovered, the refinery started processing German crude oil, and is still doing so today.

With the beginning of inflation in Germany in 1923, the economic reserves of the refinery owners were quickly exhausted. The repairs which had been postponed during World War I became extremely expensive, and technical improvements which had been omitted during that war made Salzbergen's position difficult against the growing competition from abroad. After several changes in ownership, the refinery was finally acquired by Wintershall A.G. in 1931.

Wintershall, originally in the potash industry, had at that time expanded its interest in oil production. By taking over the refinery, this sphere of interest was extended. As a result, the start toward today's position of Wintershall in the oil industry was created. With the change in ownership, Salzbergen suddenly revived. The old-fashioned equipment was replaced by modern tubestills with a capacity of more than 40,000 ton/yr (800 b/d). The further construction of cracking, deasphalting, and dewaxing rounded out the picture.

The peaceful progress was abruptly finished with the outbreak of World War II. By 1945, the refinery had been completely destroyed by approximately 4,000 bombs. In January, 1946, Wintershall received a provisional permit to start over with a 30,000 ton/yr (600 b/d) capacity. The units were restored to a point where operation was just possible. Three years later the plant was again processing 60,000 ton/yr.

In 1949, one year after the currency underwent reform, one of the essential suppositions for the good commercial development in West Germany, the management of Wintershall made important decisions. Growing oil production in Germany and the continually rising demand meant that a considerable investment was needed if Wintershall was to strengthen, or even maintain, its position in the market.

These decisions resulted in the building of a new refinery in Lingen, a few miles from Salzbergen. This plant was erected in cooperation with Gerwerkschaft Elwerath. It is connected to the crude oil fields of the Emsland area by a pipeline, and it was planned and designed primarily for the production of gasoline and diesel fuel with a capacity of 20,000 b/d. Since then, the Lingen refinery has been expanded to 50,000 b/d. New units are processing crude oils from the Middle East shipped in by a pipe line from Wilhelmshaven. Other main products are burner fuels and starting materials for the petrochemical industry.

The old refinery at Salzbergen was completely reconstructed in 1950-51 for the production of high quality motor lubricating oils, bitumen, and waxes. Capacity is now 115,000 ton/yr (2,300 b/d). German crude oil is still being processed, being hauled by rail from the Aldorf field, about 65 miles east of Salzbergen, between Weser and Ems. Process units at Salzbergen are conventional and are adequate to today's techniques: atmospheric and vacuum distillation, propane deasphalting, Furfural refining, MEK dewaxing, and clay treating.

In order to deal with the growing demand for motor oil and to be armed against the requirements of the common West European market, Salzbergen is now expanding its units to almost double the capacity, adding about 100,000 ton/yr. Erection of the new units is being handled by Lummus and Lurgi-Engineers.

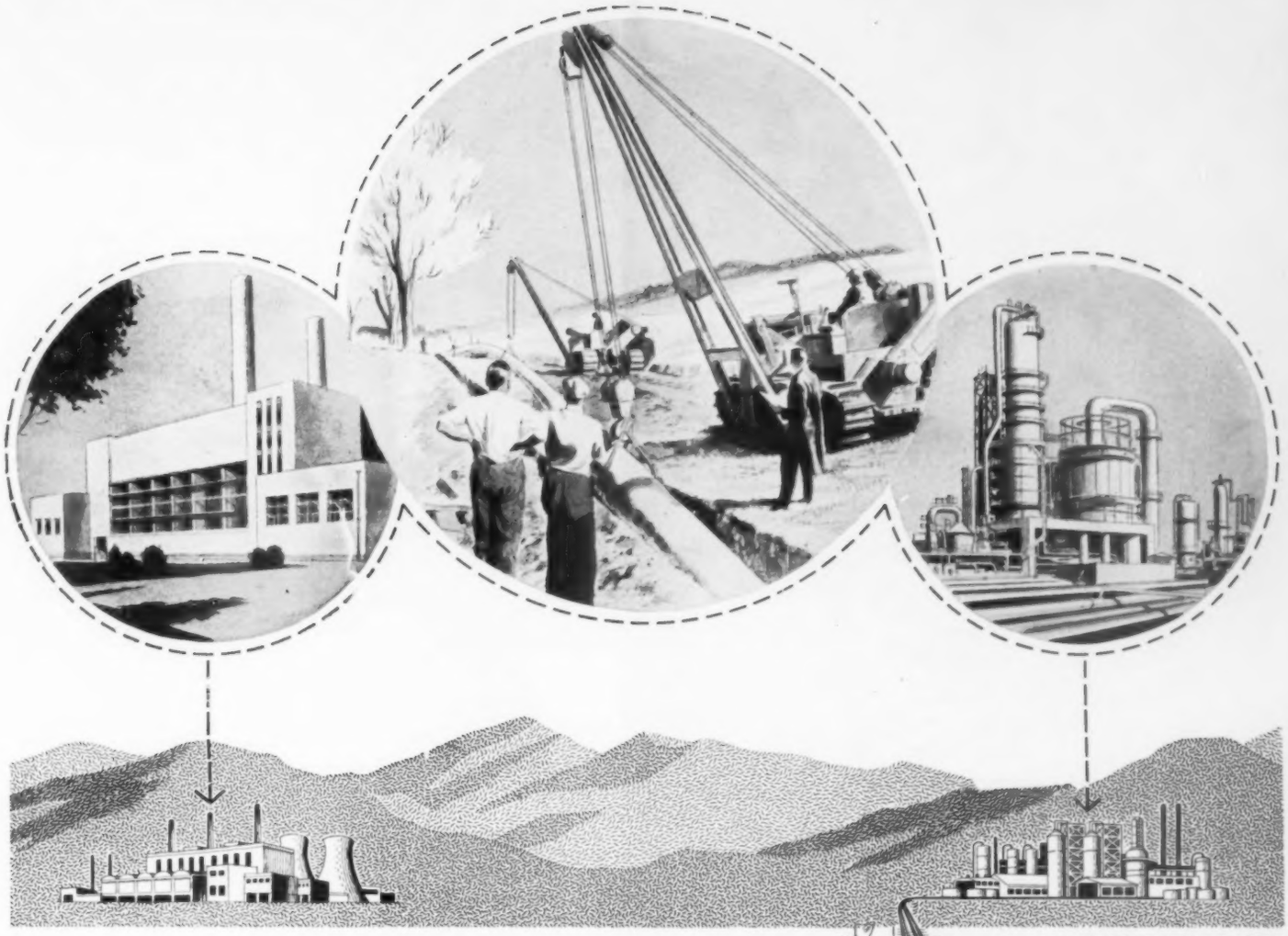
The new equipment will operate on Venezuelan crude. Together with the processing of German crude, all kinds of lubricating oils will therefore be available in the future.

From the early part of the 20th century until 1930 Wintershall had been producing, processing, and marketing potash. Because crude oils and potash are frequently found together, Wintershall also went into the producing of crude. Today, the company along with its subsidiaries represents 50% of German potash production again, after having lost 80% of its capacity in the Russian zone of the country. The company also produces and markets nitrogen and multi-purpose fertilizer.

Wintershall produces about 15% of Germany's crude oil and 35% of its natural gas. Several years ago the company started crude production abroad, in Peru and Canada, and now is carrying on exploration in Libya and the French Sahara. As a refiner, Wintershall owns Salzbergen and partly owns Gewerkschaft Erdoelraffinerie Emsland, Lingen, a new refinery under construction at Karlsruhe, and the pipe line from Marseilles.

Motor and industrial oils are distributed directly to the consumer by BV-ARAL A.G. and Detusche-Gasolin-Nitag A.G., both of which are also partly owned by Wintershall. A subsidiary of Wintershall, MIHAG, supplies wholesalers with Salzbergen products.

Almost one hundred years ago, the Salzbergen refinery received its first crude oil from the new world. Now crude is once again coming from America. The integration of Western Europe and the entire free world is a necessity. END



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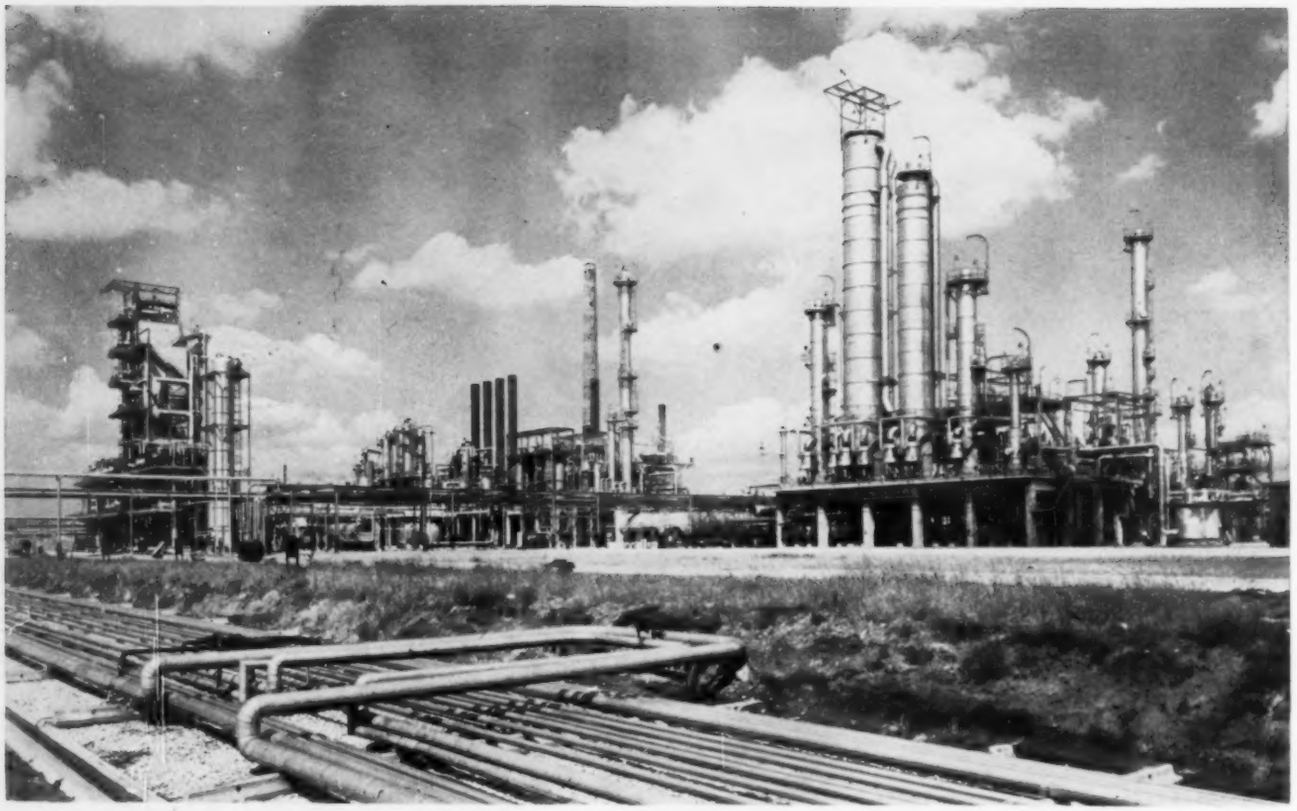

General view of new extensions at Shell Chemical's Carrington plant: styrene unit at right, and ethylene No. 2 unit at left

Carrington ~ a major new UK petrochemical center

A MOST IMPRESSIVE, and probably surprising, scene is presented to the visitor to Shell Chemical Co.'s Carrington works near Manchester who only knew the plant as it was developed by Petrochemicals Ltd. from 1947 to 1955.

Purchased in that year by Shell, the center has since, without publicity, been modified and expanded to an extent far greater than is generally realized. Already some 250 acres, roughly one-half of the site owned has been developed or allocated for plant projects for the manufacture of industrial chemicals, plastics and synthetic rubber.

About £25 million has been spent so far in modernization and expansion, and already output is at the rate of about 140,000 tons/yr, a large proportion of which is expected to be exported—some 30% by 1962 and it may well be higher. Extensions to present facilities are expected to double this capital expenditure over the next four to five years and by 1964 the staff is likely to have risen to 4,500 from the present 3,000.

Linking Carrington with the Shell refinery at Stanlow is a new system of four 23-mile pipelines, one of which supplies the naphtha feedstock for the chemical operations. Other lines are used for transfers of hydrocarbon intermediate liquid and gaseous products to Stanlow, diethylpentadiene for pesticide production, for example.

Originally, the naphtha was cracked by the Catarole process as developed by Petrochemicals Ltd. and the broad conception of its plans has been found by Shell to be sound. The process, somewhat modified, is still in use as part of the Ethylene Unit No. 1. A feature of this cracking process is the long residence time, giving a good ethylene yield at the same time as easily refined liquid fractions containing a romatics. At the time of the visit by WORLD PETROLEUM late October this unit was shut down for the revision of layout in certain respects. The gas separation plant was also being revamped and free standing columns installed.

To meet the very large increase in ethlyene and propylene requirements due to Shell's expanding product program, a new and much larger plant, a 55,000 ton/yr Kellogg unit, was commissioned in the second half of 1960. In this—the Ethylene II Unit—the cracker is linked with a Dowtherm quenching system, and the gas section employs free standing columns operating at higher pressures and temperatures than those used in the "cold-box" type of unit.

A feature of the new ethylene oxide unit,

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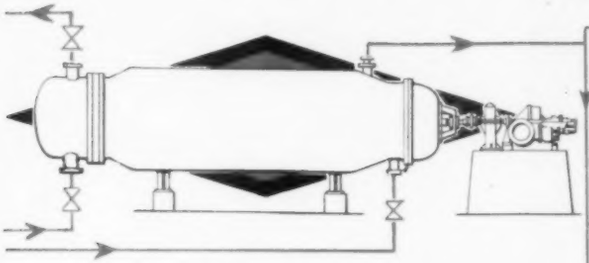

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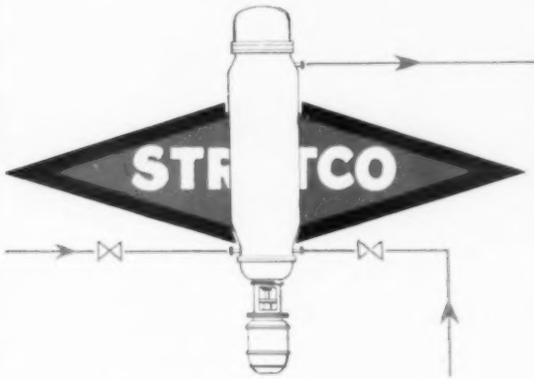

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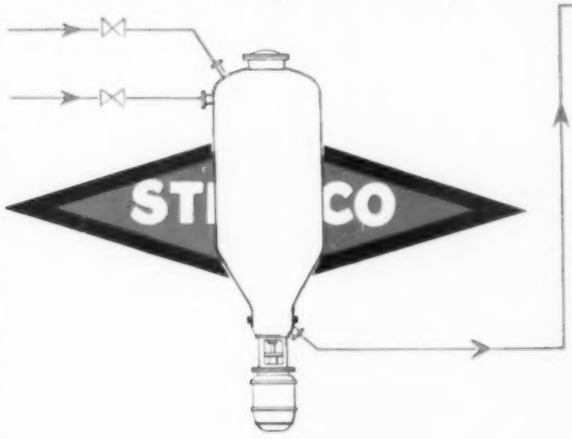

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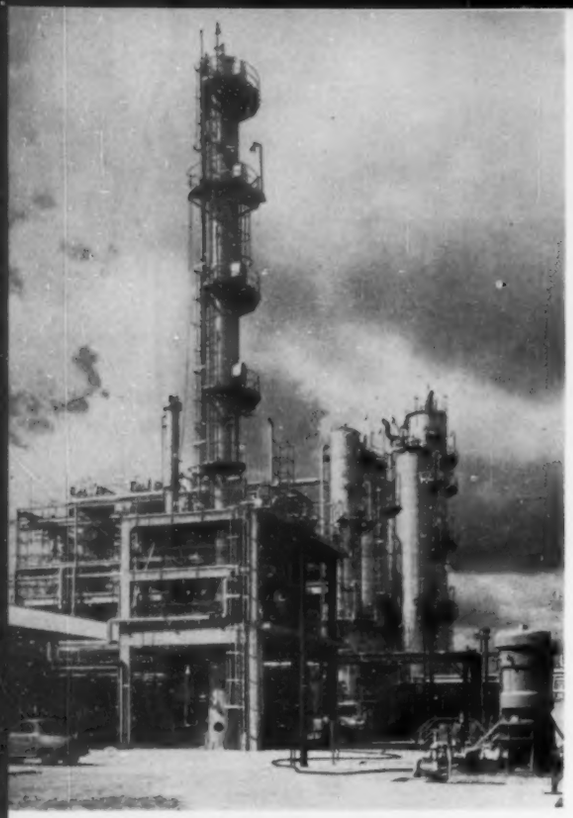


The ethylene (direct oxidation) plant at Carrington

which came on stream about a year ago, is the use of a direct oxidation process developed within the Shell group. In this plant ethylene is made to react with oxygen in the presence of a silver catalyst to yield a mixture from which pure ethylene oxide is recovered by absorption and distillation. This plant has a design capacity of 25,000 tons/yr.

In 1953/54 Ziegler patented the process by which ethylene polymer of high density can be produced from ethylene at low pressure in the presence of a catalyst. Process development work at Carrington led to the establishment of a semi-commercial plant in 1958 using this process. Construction is proceeding on a 30,000 ton/yr polyolefin complex which will produce high density polyethylene and polypropylene in one plant and low density polyethylene by the high pressure process at another. These plants will form a completely new section at Carrington and they should be on stream late 1961.

Despite the already high level of UK polyolefin production, Shell has great hopes for the development of polypropylene, the newest polyolefin to be commercialized on a large scale and for whose UK manufacture and sale Shell obtained a semi-exclusive license from Montecatini in 1959.

There are a number of reasons for these high hopes, including polypropylene's excellent combination of strength and resistance to shock, its higher resistance to temperature than low density polyethylene, and its good moulding properties.

One result of these plant developments is the claim that within a year or two Shell Chemical will be the only UK company producing all the different types of polyolefin moulding materials.

An 18,000 ton/yr monostyrene plant erected by Matthew Hall & Co. was also brought on stream in 1960, based on ethylene and benzene produced on the site. This is used in the manufacture of polystyrene moulding materials, already a noteworthy feature at Carrington because of the wide range made for many applications. These range from basic, general purpose grades to toughened and heat resistant materials. In fact, polystyrene is one of the most versatile of all plastic materials.

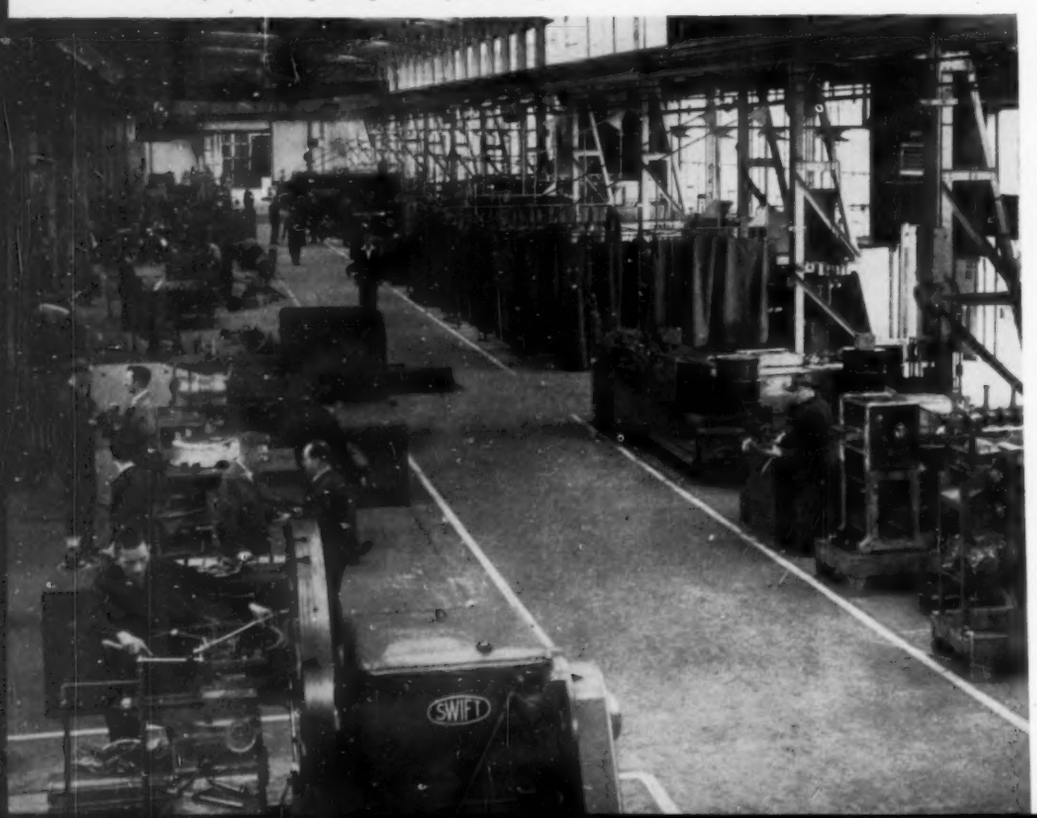
An interesting feature at the works is the use of a novel type of polystyrene bead in the manufacture of expanded, or foamed polystyrene. Gassing agents are introduced into the polymerized beads; and on heating the beads to melting point, the gassing agent blows up the softened bead to give small, very light, cellular balls. These can, after stabilization, be reheated and blown further and under controlled conditions be formed into very light expanded board sixty times as light as water. This is finding a growing use for sound insulation in blocks of flats and insulation in cold rooms. A large market also exists in chemical plants where lagging is required to preserve low temperatures. The packaging of delicate instruments etc. is also a useful outlet for this product.

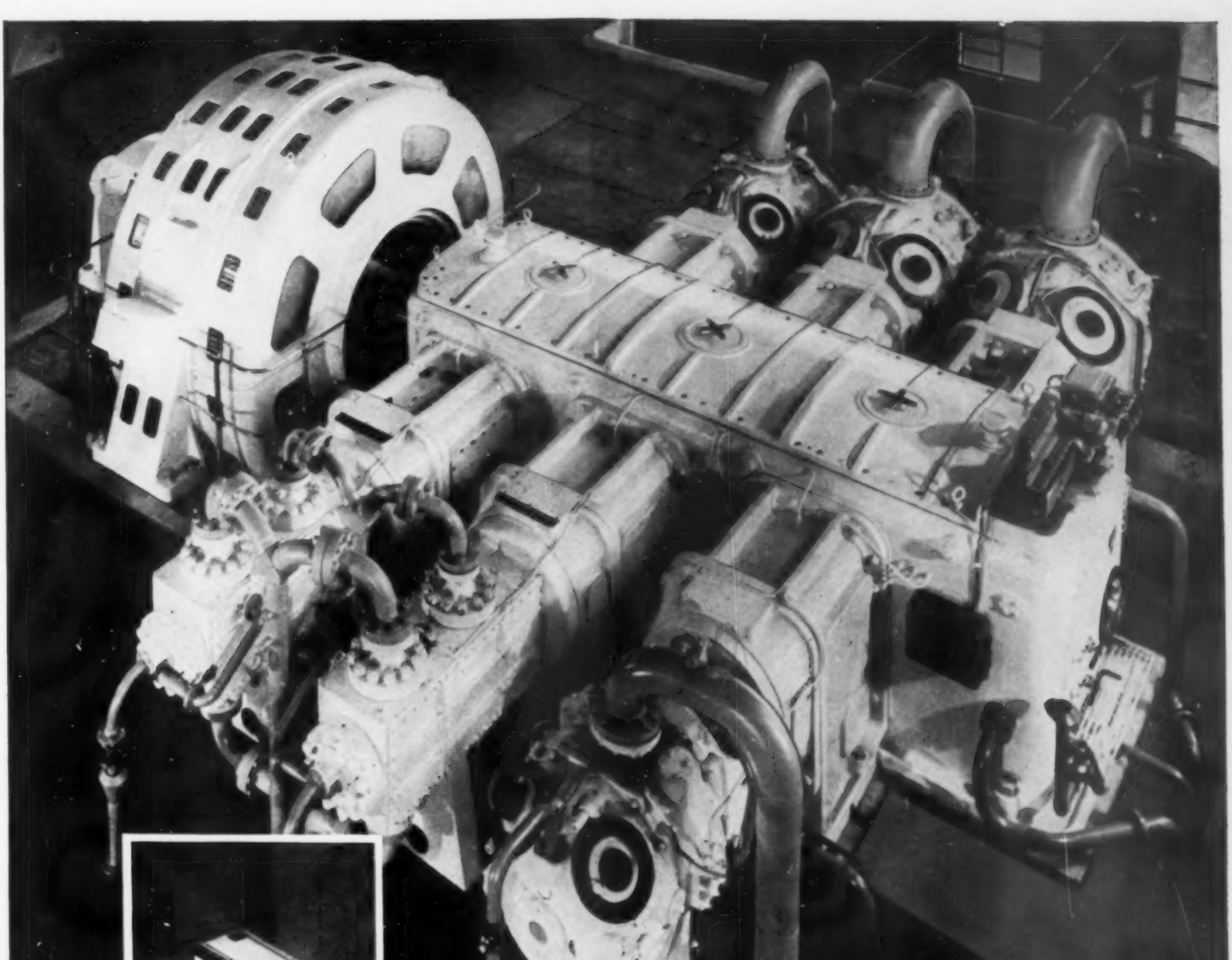
C_4 fractions will not be available until the polybutadiene/polyisoprene synthetic rubber plant is completed. A large area has been set aside and site-breaking is due to start at an early date, but operation is not expected until 1963. The polydiene rubber plant, which will be of a very flexible nature, is still in the design stage. These new rubbers are the result of intensive Royal Dutch/Shell research. Production, it is said, will be "substantial" and it is probable that Carrington will concentrate at the start on the polybutadiene types (both low and high density), leaving Shell's Pernis plant to supply the polyisoprenes.

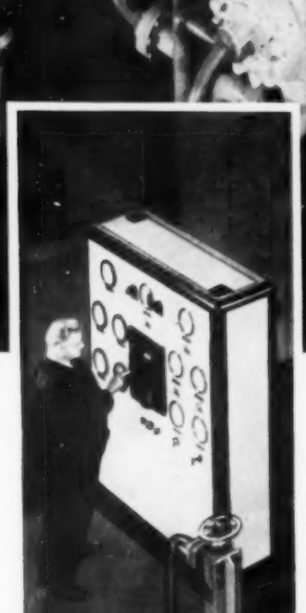
In the course of the recent visit considerable construction activity was to be seen in all directions. Staff strength has outgrown present facilities and new offices are being built; new pilot plants and a laboratory are nearing completion—the old laboratories will become an instrument shop; considerable expansion in engineering workshop facilities was in an advanced state; an alkylation unit is due to come into use early 1961; and works electricity generating capacity will soon be augmented by a 10,000 KVA turbo-alternator when a second 1,500 psi boiler is completed. To date two 2,000 KVA turbine generating sets have been in operation, with further power drawn from the national grid, while steam raising is currently provided by one 1,500 psi boiler and four of 600 psi.

To sum up, there is no doubt that, silently the nucleus of a major new UK petrochemical center has been built up by Shell Chemical Co. at Carrington—one, it is safe to assume, is clearly designed to develop into something of far greater importance from all aspects. END

A part of the engineering workshops at Carrington







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Gas lights Europe's hopes

In its second report, "The Gas Industry in Europe, 1960," the Gas Committee of the Organization for European Economic Co-operation (OEEC), feels quite certain natural gas will supply a larger proportion of energy requirements in OEEC member countries than it has done in the past. Judging from the foreseeable scale of output and imports, however, it is highly improbable that the advent of natural gas will cause a revolution in their energy balance sheets; natural gas will not account for more than a relatively small percentage of total consumption of all forms of energy.

When imports from abroad, and especially from the Sahara and Libya, however, are taken into account, the prospects for natural gas appear to the committee to be exceptionally good, and it looks like African gas will play an important part in future supplies for Western Europe.

This second report presents a broader survey than the first, published in 1958 and covering a general review of the gas sector over the period 1954-56. Broadly it attempts to outline the present position of the industry and its future development.

The report is divided into two parts. *Part 1* contains four chapters: I and II deal with production and consumption of the different kinds of gas (gas-works, coking plant, blast furnaces, producer plant, natural gas and refinery tail gas); III discusses the competitive position of gas on the fuel and power markets; and IV reviews the technical aspects of transporting gas from the Sahara or from other sources outside Europe. *Part 2* deals with production, demand and the position of gas in the US.

There are two annexes, one dealing with production and use of crude or reformed natural gas, showing their respective advantages and drawbacks, and the other gives a series of tables covering production and consumption of gas of all kinds for the period 1956-58.

Some extracts dealing with the natural gas aspect follow from the summary and conclusions of this 110-page report.

In 1958, manufactured and natural gas supplies, excluding blast furnace gas, represented 6.9% of the total end-use energy requirements of the OEEC member countries. Gas therefore represented a relatively small proportion of all energy used, but it has to be borne in mind that this is one of the higher forms of energy, the use of which is restricted almost entirely to the production of heat.

While overall energy requirements have been expanding by about 4% per annum during the last ten years, the demand for gas (including blast furnace gas) has shown an average annual increase of about 6% in spite of the slight check experienced in 1957 and 1958 owing to the economic recession.

The average annual increase in the gas requirements of the OEEC area between now and 1965 will probably be more or less the same, i.e., 4.5% to 5.5%, but the situation will probably vary from one area to another. In areas with a predominance of manufactured gas supplied by gasworks and coke ovens, the rate of expansion will generally be slower; where natural gas has already been introduced, on the other hand, the rate of increase in demand is expected to be much higher, especially if transport networks are laid to enable the gas to reach places which are far away from the production areas.

The question then is to know what part will be played by each of the sources of gas in meeting the demand.

There is still some uncertainty with regard to the amount of natural gas which will be available in Europe in 1965, and the more distant future is even more uncertain. For some years now, this gas has made a major contribution to gas supplies in Italy, and the last two years have witnessed a substantial increase in production in France. Prospecting is going ahead in the Federal Republic of Germany, Austria and the Netherlands, and new discoveries are now being made.

In 1954, the OEEC area produced approximately 4,000 million cubic meters of natural gas (at 9,000 kcal/cu m); this can be expected to reach 11,000 million during 1960, and it would not be unduly optimistic to expect 16 or even 20,000 million cubic meters by 1965. These figures, of course, refer only to the home production of member countries excluding reserves overseas.

In calorific value, therefore, output by 1965 should be equal to more than half the expected production of manufactured gas.

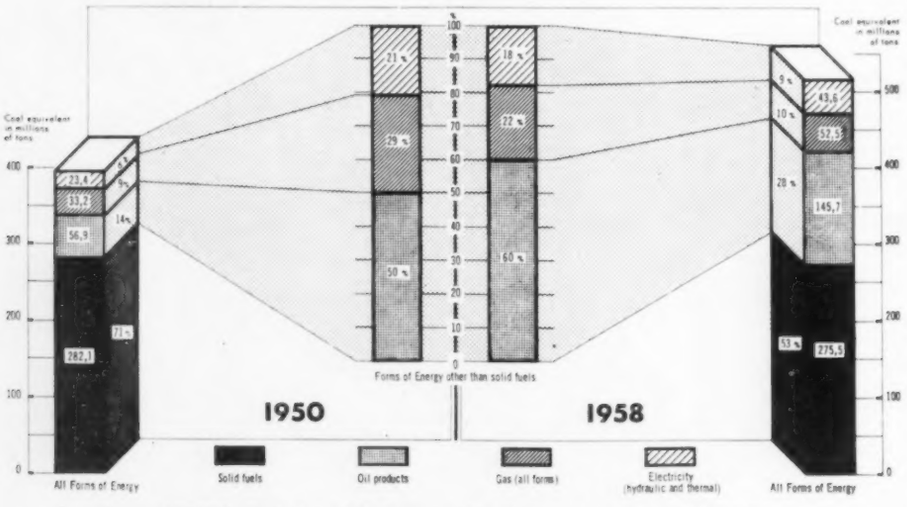
When imports from abroad, and especially those from the Sahara and Libya, are taken into account, the prospects for natural gas appear to be exceptionally good, and it looks like playing an important part in the future even more than it has done in the past. Despite the technical advantages and the convenience to the consumer, his choice will, in the long run, be dictated by price.

Another important matter is investment and the way in which it should be directed.

One of the features of the gas industry is the high proportion of continuous expenditure represented by the construction and equipment of plant and distribution systems. In view of the discovery of natural gas in Europe and Africa, and the differing structures of the various gas industries, there are indications that investment may take two different forms; i.e., (1) conventional and new types of plant producing manufactured gas, or (2) long-distance transport of natural gas. The difficulty is to assess how large a share should go to each.

In the future, the installations producing town gas will tend to become distribution centers for gas made from raw materials of different kinds and, in certain cases, for natural gas. This gives rise to the question of whether natural gas should be distributed as such or after re-forming, and a great deal of research is being carried out with a view to deciding on the most economical solution for each case (this subject is discussed in a 14-page annex to the main report).

In the case of natural gas, the main policy will be to invest in new, long-distance transport systems. This has two different aspects: *first*, the length and diameter of transport piping in terms of the amount of capital required and the corresponding service charges; *second*, the need to work the pipeline to full capacity, which in turn raises the question of market outlets. (Continued on page 81)



Europe (OEEC)—Breakdown of final consumption of energy forms. Source: OEEC Report.

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World Petroleum Statistics

FREE WORLD SUPPLY AND DEMAND, CRUDE AND PRODUCTS, APRIL 1960

(Thousands of barrels)

Source: USA Bureau of Mines, Division of Petroleum

Country	CRUDE PETROLEUM					REFINED PRODUCTS			
	Production	Imports	Exports and reexports	Stock change, other demand, and loss	Total 1/ refinery input / Total 2/ refinery output	Imports	Exports and reexports	Domestic demand (incl. Bunkers) 3/	Bunkers-all flags (as reported)
NORTH AMERICA									
Canada	14,693	7,826	4,369	-2,249	20,583	851	196	4/21,761	
Mexico	7,546	-	-	-456	8,574	588	204	8,938	
United States (incl. Alaska and Hawaii)	211,132	33,877	270	+5,930	251,687	24,614	6,477	4/276,431	7,001
Subtotal	233,371	41,703	4,639	+3,225	280,844	26,053	6,897	307,130	
CENTRAL AMERICA AND CARIBBEAN									
Costa Rica	-	-	-	-	-	E/ 98	-	98	
Cuba	9	E/2,000	-	-484	E/2,493	E/189	-	2,682	
Dominican Republic	-	-	-	-	-	E/217	-	217	
El Salvador	-	-	-	-	-	E/123	-	123	
Guatemala	-	-	-	-	-	E/274	-	274	
Haiti	-	-	-	-	-	E/ 72	-	72	
Jamaica	-	-	-	-	-	390	-	390	E/ 90
Nicaragua	-	-	-	-	-	E/127	-	127	
Panama, Canal Zone	-	-	-	-	-	886	175	711	424
Panama, Republic	-	-	-	-	-	E/214	-	214	
Puerto Rico	-	1,846	-	-346	2,342	450	867	1,925	
Subtotal	9	3,846	-	-830	4,835	3,040	1,042	6,833	
SOUTH AMERICA									
Argentina	4,690	2,036	-	-69	6,795	743	7	4/7,170	116
Bolivia	237	-	89	+3	145	9	3	151	
Brazil	2,309	3,207	478	-389	5,427	E/4,008	E/ 25	9,410	
Chile	572	166	-	-40	780	E/583	-	1,363	
Colombia	4,737	-	2,757	-162	2,207	E/ 26	316	4/1,565	E/115
Ecuador	225	E/138	-	-	363	13	-	376	
Netherlands Antilles	-	E/19,979	-	+753	20,046	E/1,325	E/16,416	5/4,955	
Paraguay	-	-	-	-	-	E/ 61	-	61	
Peru	1,545	-	244	-20	1,321	288	433	1,176	31
Trinidad	3,573	4,613	437	+915	6,837	E/285	E/5,799	2/1,323	1,069
Uruguay	-	651	-	-150	E/801	117	-	918	E/ 78
Venezuela	81,474	-	E/58,627	-76	23,085	E/ 71	18,832	4/4,324	E/1,591
Subtotal	99,362	30,790	62,632	+765	67,807	7,529	41,831	32,792	
WESTERN EUROPE									
Austria	1,405	394	577	+85	1,157	727	49	4/1,531	
Belgium and Luxembourg	-	3,641	-	-549	4,210	2,051	1,473	4,788	266
Denmark	-	-	-	-19	E/ 19	2,629	7	2,641	132
Finland	-	703	-	+53	E/650	654	-	1,304	
France	1,137	19,567	-	+2,543	18,177	1,542	3,865	4/16,415	916
Germany, West	3,312	11,018	-	-654	14,984	5,013	923	19,074	352
Greece	-	1,092	-	+354	738	408	-	1,146	
Iceland	-	-	-	-	-	423	-	423	
Ireland	-	968	-	+237	731	196	-	907	40
Italy	901	17,204	419	+164	18,792	924	4,126	4/11,591	1,790
Netherlands	1,044	10,293	-	+1,529	10,456	3,050	6,177	7,329	560
Norway	-	46	-	+46	-	2,282	-	2,282	E/175
Portugal	-	577	-	-114	691	291	273	709	
Spain	-	2,756	-	+157	2,681	137	242	2,576	E/154
Sweden	-	2,026	-	+484	1,542	4,070	79	5,533	E/247
Switzerland	-	-	-	-	-	1,703	-	1,703	
United Kingdom	53	26,723	-	+2,896	23,880	9,214	4,368	4/28,136	2,458
Yugoslavia	345	301	-	-33	679	E/ 88	E/ 32	735	
Subtotal	8,197	97,309	996	+7,179	99,387	35,402	21,614	108,843	
MIDDLE EAST									
Aden	-	1,015	-	-86	1,101	1,962	374	2/2,689	E/2,192
Bahrain	1,353	4,438	-	+38	5,743	86	5,273	2/668	316
Iran	29,453	-	18,223	-94	E/11,324	-	7,462	3,862	E/471
Iraq	27,808	-	E/27,316	-738	E/1,230	2	-	1,232	
Israel	70	E/838	-	-	908	E/898	-	1,806	E/ 31
Jordan	-	-	-	-	-	E/ 96	-	96	
Kuwait	43,779	-	41,655	-3,186	5,310	2	2,301	2/3,011	2,091
Lebanon	-	E/434	-	-	E/434	E/ 28	-	462	E/ 67
Neutral Zone	3,941	-	E/2,941	-	E/1,000	-	E/490	2/510	E/200
Qatar	5,093	-	E/5,075	-	E/ 18	-	-	18	
Saudi Arabia	36,317	-	28,596	+957	6,764	2	5,191	1,808	E/1,060
Turkey	207	-	-	+47	160	595	-	755	
U.A.R., Syria	-	E/457	-	-	E/457	18	-	475	
Subtotal	148,019	7,174	123,806	-3,062	34,449	3,689	21,091	17,382	
AFRICA									
Algeria	3,950	-	3,442	+508	-	1,001	-	4/850	
Angola	37	-	-	-73	110	71	-	181	E/ 6
Republic of the Congo (Belgian Congo)	-	-	-	-	-	E/296	-	296	
Canary Islands	-	1,512	-	-123	2,256	220	1,244	2/1,232	469
Ethiopia	-	-	-	-	-	E/ 57	-	57	
States formerly in French Equatorial Africa	461	-	532	-71	-	E/178	-	178	
States formerly in French West Africa	-	-	-	-	-	E/341	-	341	
Ghana	-	-	-	-	-	216	-	216	
Kenya	-	-	-	-	-	E/503	92	411	E/ 76
Liberia	-	-	-	-	-	E/ 32	-	32	E/ 3
Malagasy Republic	-	-	-	-	-	58	-	58	
Morocco	61	E/ 74	-	-	135	538	-	4/510	E/ 42
Nigeria	479	-	584	-105	-	370	-	370	
Federation of Rhodesia and Nyasaland	-	-	-	-	-	E/331	-	331	
The Sudan	-	-	-	-	-	423	-	423	
Tanganyika	-	-	-	-	-	E/ 44	26	18	
Tunisia	-	-	-	-	-	304	-	4/266	
Uganda	-	-	-	-	-	E/116	14	102	
Union of South Africa	-	575	-	-27	602	1,565	170	1,997	
U.A.R., Egypt	1,869	E/1,000	127	+388	2,354	E/596	E/123	2,827	E/185
Subtotal	6,857	3,161	4,685	+497	5,457	7,200	1,669	10,696	
SOUTH ASIA, FAR EAST, AND OCEANIA									
Australia	-	6,964	-	+305	6,868	929	1,004	6,793	E/632
British Borneo	2,859	-	1,407	-	E/1,452	E/ 77	E/1,261	268	77
Burma	290	-	-	-27	317	15	4	328	
Ceylon	-	-	-	-	-	377	-	377	237
India	255	E/3,391	-	-	E/3,646	E/1,855	E/192	5,309	E/230
Indonesia	12,828	E/708	6,575	+287	E/7,061	E/271	4,473	2,571	188
Japan	274	12,809	-	-2,808	16,336	1,246	302	19,080	
Korea, South	-	-	-	-	-	E/373	-	373	
Malaya and Singapore	-	249	173	+76	-	3,943	1,569	1,374	1,046
Netherlands New Guinea	130	-	E/130	-	-	-	-	Insig.	
New Caledonia	-	-	-	-	-	E/ 34	-	34	
New Zealand	-	-	-	-	-	827	-	827	E/130
Pakistan	177	-	-	-25	E/202	E/1,141	E/ 21	1,322	
Philippines	-	721	-	-70	791	E/859	-	1,650	
Taiwan	1	553	-	-23	577	15	7	585	
Thailand	-	-	-	-	-	900	-	900	24
Vietnam, South (incl. Cambodia)	-	-	-	-	-	E/461	-	461	E/ 3
Subtotal	16,814	25,395	8,285	-2,285	37,250	14,523	8,833	42,452	
WORLD TOTAL EXCLUDING EASTERN EUROPE, U.S.S.R., & MAINLAND CHINA	512,629	209,378	205,043	+5,489	530,029	97,296	102,977	526,128	

E/ Estimated based on latest available data.
1/ Total input includes crude runs to stills plus runs of other unfinished oils, topped crude and natural gas liquids blended.
2/ Total output includes refined product output plus refinery fuel and loss; excludes liquefied petroleum gases sold directly for fuel and chemical uses from natural gasoline plants.
3/ Unless otherwise specified, data represent apparent domestic demand (including inland demand, refinery fuel and loss, and bunkers). Apparent domestic demand is derived from the components of refined product output, plus imports, minus exports, with no allowance for changes in stocks.
4/ Domestic demand as reported, including refinery fuel and loss, stock changes, and bunkers; also includes, where available, liquefied petroleum gases sold directly for fuel and chemical uses from natural gasoline plants.
5/ Apparent domestic demand is heavily influenced by refinery fuel and loss, and bunker loadings.

Soviet Oil Threatens The Middle East

(*Continued from page* 41)

As things are, we are likely to be faced, in the course of time, with a situation in which the Middle East is subjected to new and fierce competition in the export of oil to the world market, and in which the West is simultaneously subjected to additional pressure in the cold war by a Russia with fresh worlds to conquer and the potential means of conquering them. Is it not a question of simple common sense that Arab-Western oil relations should be cemented on a basis of friendly and thriving partnership before this threat materialises, so that the Arabs may be assured of continued trade and the West of broad-based Arab support in a new and complex phase of the cold war?

Let me point out one or two cogent facts affecting the general situation. It is, in the first place, obvious that the principal concern of oil companies is to sell oil. There is a world surplus of oil today, and the Russians—whose own oil resources exceed their productive capacity—are trying hard to cash in on the existing market by dumping fuel in India at cut rates in exchange for rupees. They are treating Cuba as another dumping ground, and everything points to the fact that the competition they provide will become more, rather than less, strenuous as time goes on. The Western oil companies would do well to find an additional market and concentrate on realizing its fullest possibilities from the outset. But does such a potential market exist?

I believe that it does, in the very Arab world from which the West's oil is garnered. It may be judged superfluous to attempt to sell oil in the region from whence it comes, but, while the process of 'sending coals to Newcastle' is proverbially a wasted exercise, nobody pretends that no coals are brought there. The Arab countries, provided that they were developed according to their needs, could become one of the world's most steady customers for the oil produced within their own borders.

Development would necessarily result in increased prosperity. Increased prosperity would inevitably produce a greater demand for oil, for the graphs of material welfare today are inscribed in petroleum. A greater demand for oil would manifestly reap larger profits for the oil companies—profits realized in dollars and sterling. It is as simple as that. The Arab countries would never buy Russian oil, because they know that their chances of affluence rest largely on the sale of Middle East oil. Why not, then, give them the chance to be affluent?

It may be said, in this context, that there is a joint venture under discussion by the oil-producing Arab States and the Western oil companies to open refineries in the newly liberated countries of Africa. Such states, as they develop—and their development is likely to be dramatically swift—will naturally need more and more oil with each year that passes. Their natural inclination would be to buy Arab rather than Russian oil, and refineries installed on the spot would at once make its acquisition easier and its price lower. END

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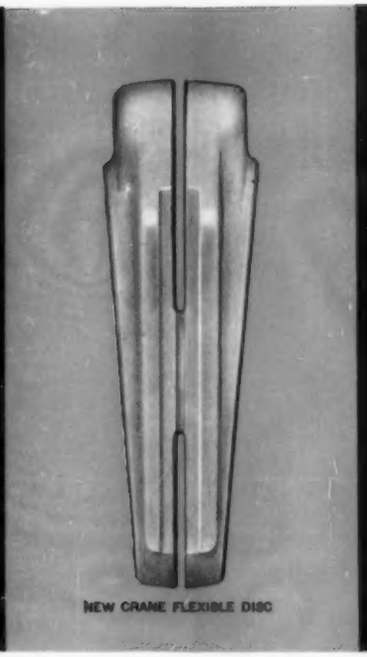

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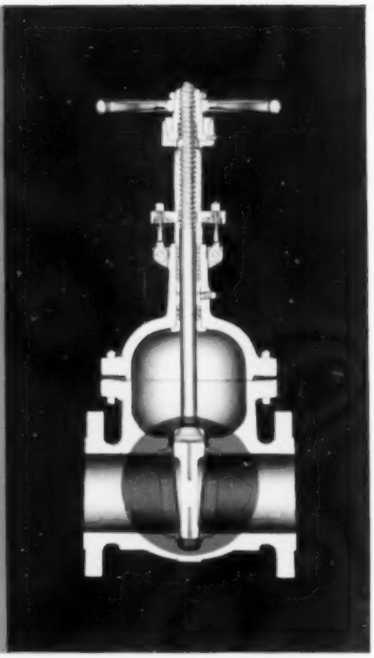

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Libyan Turnbacks Watched

(*Continued from page 44*)

procurement or installation of physical assets, the cost of drilling wells not productive of petroleum in commercial quantities and expenses of organizing and initiating petroleum operations in Libya, may be deducted in the year in which they are incurred or they may be capitalized and amortized. The election to deduct or to capitalize as aforesaid may be made annually by the company. The unamortized balance of the cost of physical assets abandoned during the year may be deducted in the year of abandonment.

In respect of the amortization during that year of capital expenditures on physical assets used in connection with such operations and of expenses incidental to their procurement and installation, computed in the case of all such expenditures incurred before the effective date, irrespective of the date incurred, at a rate not exceeding 20% per annum, to be elected annually by the company until all such expenditures are fully amortized; and in the case of all such expenditures incurred on or after the effective date, at a rate not exceeding 10% per annum, to be elected annually by the company until all such expenditures are fully amortized.

Where in respect of any year the total of the deductions taken exceeds the gross income in respect of that year before taking the deduction, the excess shall be carried forward and deducted from the profits of subsequent years up to a maximum of ten years.

The royalty is independent of the company's income or profits and cannot be reduced in any manner.

Exchange Control—Currency: The company shall be entitled to retain abroad all funds acquired by it abroad including the proceeds of sales in so far as such funds may exceed the company's requirements for the purpose of its operations in Libya. Revocation: The Commission may, by notice in writing to the company, revoke a concession in the following circumstances: 1) the company fails to commence operations within eight months as required by work obligation, or fails to meet its expenditure obligations; 2) any surface rents or royalties payable under its concession are in arrears for six months; 3) the company goes into liquidation, except voluntarily for the purpose of reconstruction or amalgamation, or a receiver is appointed; 4) the company fails to perform any of its obligations as set forth in the regulations.

If there is a discrepancy as to the company's and Commission's belief the company may settle by arbitration.

Arbitration: Any disputes arising out of or in connection with the concession, unless otherwise resolved, are to be settled by arbitration in accordance with detailed provisions provided for. The concession is governed by and interpreted in accordance with the laws of Libya and such principles and rules of *international law* as may be relevant and the arbitration award must be based upon these laws, principles and rules.

Force Majeure: Failure by the company to carry out any of the provisions of its contract shall not be deemed to be a breach of its concession if it shows that the failure has arisen from force majeure, namely acts of God, insurrection, riots, war, strikes or any other unforeseen circumstances. END

Houston NOMADS Meet

122 members and guests of the Houston Chapter of Nomads heard informative reports of world-wide oil activity from ten international guests at its November meeting. Principal speaker for the evening was Carleton Speed, well-known Houstonian, who described a recent and extended tour of Russia. International guests pitcured are, left to right, H. C. Pierson, Global Supply Co., B. A. de Madiros, Fresinbra, Rio de Janeiro, Brazil; Guillermo de la Torre, Cameron Iron Works, Mexico City; John Edwards ACF Industries, London, England; and Andre Brun, C.F.P.A., Algeria. International guests present but not pictured were Jorge E. Malenchini, M.C.A., Buenos Aires, Argentina; Abdi Durukal, Petroleum and Mining Equipa, Geneva, Switzerland; Cliff Beasley, Reed Roller Bit Co., Maracaibo, Venezuela; Edwardo Barnetche, Perforadora Latina, Mexico City; J. M. de la Garza, Perforadora Latina, Mexico City.

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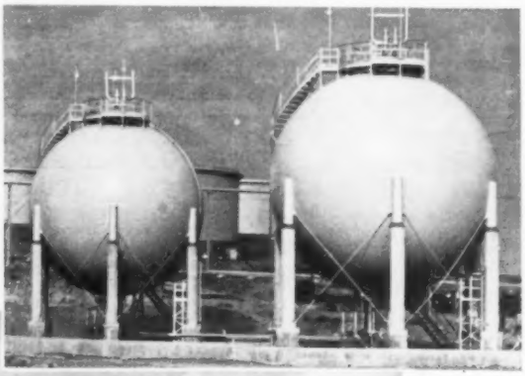
Illustrated are:

LEFT: A section of the Storage Tanks supplied.
RIGHT: Two 36 ft. diam. Spheres operating at 40 p.s.i.
BELOW: Liquified Petroleum Gas Drums 10 ft. inside diam. x 116 ft. long operating at 226 lbs./sq. inch.



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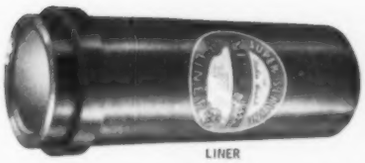
The Mission  Mission

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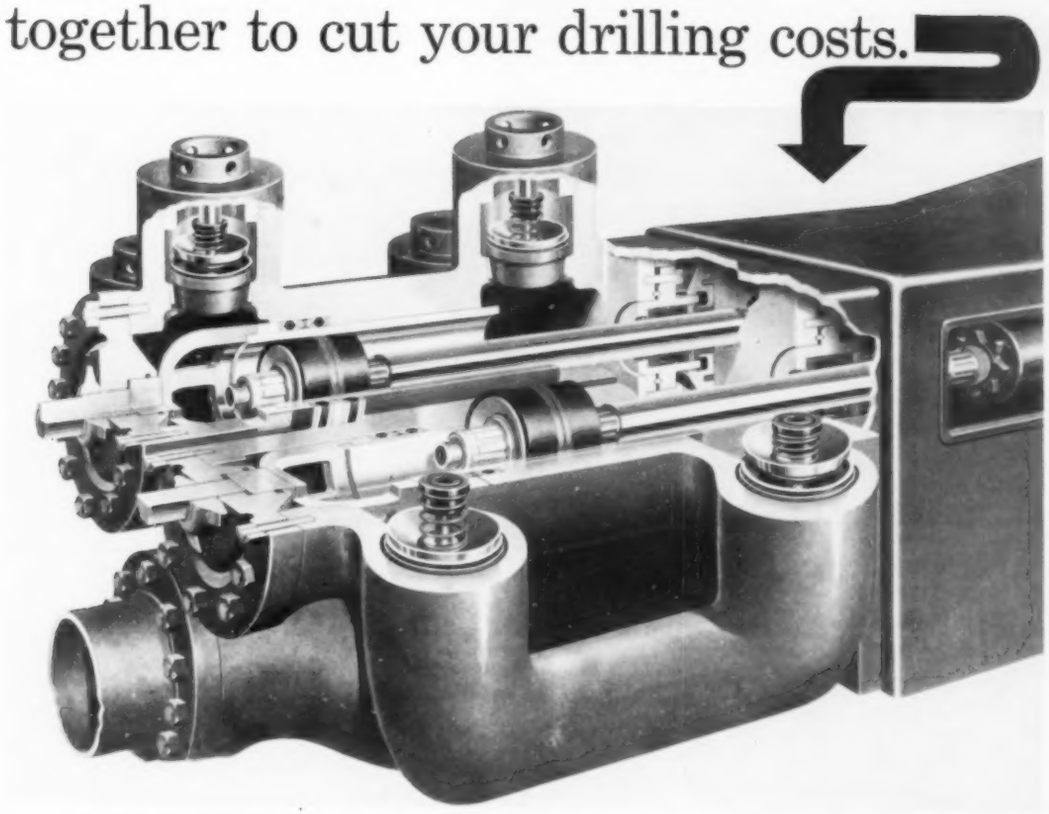

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Washington Pipeline

(*Continued from page 5*)

First hint of this—and it was followed by several others from the Capitol and elsewhere—came in a report of James M. Landis to President Kennedy on the status of independent regulatory agencies.

Among half a dozen such agencies, Landis picked out the Federal Power Commission as "the most dismal failure in our time of the administrative process."

He made two points that jolted gas producers. In one, he indicated he wants tougher controls over gas prices. In the other, he indicated he wants a national fuels policy as urged by coal.

On prices, Landis accused FPC of "unwillingness" to carry out court orders that it control prices at the wellhead. He called FPC's actions "substantially contemptuous."

FPC has repeatedly asked Congress to pass laws to ease up its powers to control gas prices. Some say the FPC has stalled for six years in exercising control while hoping Congress would act. FPC also is said to be too cozy with gas company attorneys.

Things are so bad at the FPC, the report added, that there is "a large measure of agreement" that an entirely new agency should be created to handle gas prices. Landis, himself, doubts this is needed.

Landis added that FPC's new effort to control gas prices by ceilings in areas "came far too late" to do much good. It freezes prices at the highest level ever, he feels.

Most alarming for producers, perhaps, is his view that the agency needs "dedicated members with the consumer interests at heart." Industry officials at times feel the present FPC is too consumer-minded.

As for a fuels policy, Landis spoke throughout of the need to coordinate policy in energy, transportation and communications.

Specifically, he wants to "create within the executive office of the President with appropriate powers an office for the coordination and development of energy policy with authority to propose to the President plans for the development of the energy resources of this nation."

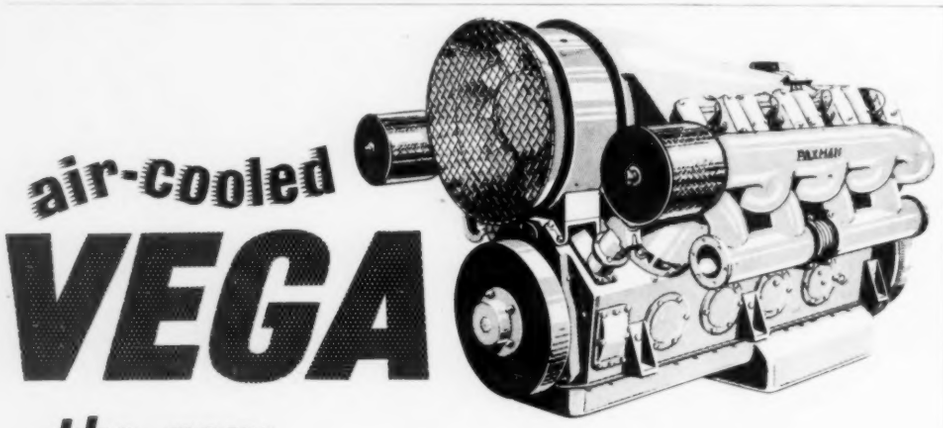
Coal forces rubbed their hands in glee at these words. They were further cheered when a Senate committee under Sen. Paul Douglas, D., Ill., followed this up a few days later with a similar recommendation, specifically asking help for coal at the expense of gas and oil.

In a more general vein, Landis called for an overseer under the President as a source of "imaginative and creative activity" and to coordinate policy. He wants the President to ask Congress for power to reorganize agencies. He wants the President to reorganize the FPC as one of his first actions. One part of the action would be to make clear that the chairman of the FPC and other agencies serve at the pleasure of the President.

Chairman Jerome K. Kuykendall of the FPC has been reported to feel that present authority allows him to continue as chairman, even though he is a Republican, named by a Republican president.

While these actions would cut down on the power of a chairman, Landis called for others to build it up. He would make clear that the chairman of an agency is in charge of budgets and parceling out money put up by the Congress; he is in charge of hiring, except jobs to be filled by the President and special assistants to fellow commissioners; he would give the chairman a significant extra salary over that of other members and "a moderate entertainment allowance." Longer tenure for members, perhaps for ten years, would be good, he feels, but lifetime is too "dangerous."

The report of Landis, former dean of the Harvard Law School, and himself head of several agencies in the past, is written in clear and biting language. This is novel in a world of the big word and the vague meaning. While it remains to be seen how much of it Congress and the White House will accept, the report already is having an impact in government circles. It promises to have an impact for years to come. The impact won't be good for independent producers of gas. It may not be good for some gas pipe line companies which use ex parte contacts with FPC members routinely. Landis wants such contracts forbidden.



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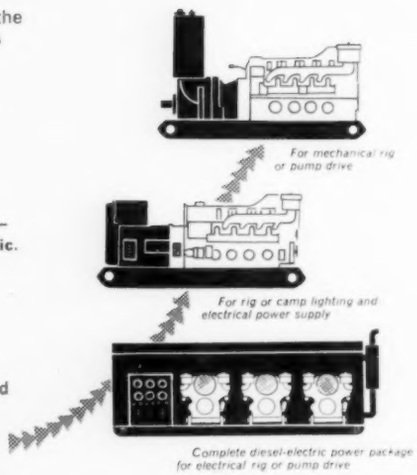
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Crude Prices Up Slightly

Prices of crude oil, natural gas and natural gas liquids climbed a notch during 1960, says the U. S. Bureau of Mines. But production of crude oil fell, while output of natural gas and the liquid rose. Net result is that the producer of oil and gas was a shade worse off in gross income than in 1959.

Gross income for the producers came to $9,873,082,000, a drop of about one tenth of one per cent from the 1959 total of $9,943,520,000, the figures show.

Here is the story in table form:

Product	1959 revenues	1960 revenues
Crude oil	$7,464,600,000	$7,501,480,000
Natural gas	1,726,112,000	1,559,352,000
Natural gas liquids	752,808,000	812,250,000
Total	$9,943,520,000	$9,873,082,000

The table is based on these figures from the Bureau:

Crude oil—Production in 1960 was 2,569 million barrels, down 0.2% from 1959. Average value at the wellhead was $2.92 a barrel, up two cents from 1959.

Natural gas—Marketed production was 21,692 billion cubic feet, a gain of 5% from 1959. Average value in 1960 was 13.6 cents per thousand cubic feet, up from 12.9 cents.

Natural gas liquids—Production last year was 14,250 million gallons, up 6%. Average value at the plant was 5.7 cents, against 5.6 cents in 1959.

Independent Petroleum Association of America disagrees that crude oil prices rose. IPAA says they dropped three cents a barrel, but it says the average wellhead price still was $3 a barrel, well above the BM estimate.

Water Pollution Lessens

An oil company official sees water pollution as "less of a problem" in the future.

Leland C. Burroughs, assistant to the vice president for manufacturing of Shell Oil Co. said industry is making "good progress" in cutting down its pollution of waters.

If cities and farm users make "equal efforts" he said, water pollution will become "less and less of a problem in future years."

Burroughs said that cries of water shortage are often made without regard to the fact that industry and other users can use water over and over again, so the water is not lost.

CONTRACTORS TO THE OIL INDUSTRY

MILFORD HAVEN, SOUTH WALES: In the foreground the Angle Bay Terminal of the British Petroleum Company. Tanks supplied by Motherwell Bridge & Engineering Company Ltd., and erected by Mothercat (Britain) Ltd. The tanks are located in an old fortification. In the background the new Esso Refinery at Milford Haven, where the same organisation supplied and erected approximately one third of the tankage.

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Oil, New Africa and Old Concessions

(*Continued from page 49*)

Manganése de Franceville, 15%; and the Bureau Minier, a French government corporation, 22%. Shortly after its establishment, the company received its first exploration permits. Between 1956 and 1958, the fiscal details of its exploitation and transportation operations were laid down either by the Grand Council of French Equatorial Africa or by the territorial assemblies of Gabon and the Middle-Congo (now Congo Republic). The latter territory's port of Pointe Noire is to be the terminal of a combined cableway/railroad route for bringing the mineral output to the sea. A concession agreement in the form of a convention was concluded in 1959 between the governments of Gabon and the Congo and the Governor-General of the Territorial Group of French Equatorial Africa on the one hand and the company on the other hand. Under the terms of this convention, COMILOG bound itself not to move its registered office from Gabon without the prior agreement of the government; to supply any quantities of manganese required by any industries established in Gabon and the Congo; and to further the training of local labor within the framework of its operations.[8]

Article 12 of the above-named convention is perhaps the most interesting from the point of view of the present discussion in terms of concession practice in an area in the full swing of political development. That article states, in essence, that any constitutional changes which might affect the juridical character of the officiel or governmental parties to the convention shall not modify the rights and duties of the company as governed by the relevant earlier legislative and executive instruments. It was this article which was invoked when, under a protocol of agreement signed in June 1959 between the company and the republics of Gabon and the Congo which had, by that time, opted for autonomous status, the company recognized the new status of the two republics.

An essentially similar process of transition may also be expected in the newly-independent Islamic Republic of *Mauritania,* where application for extensive petroleum exploration permits had been made by the Société Africaine des Pétroles (S.A.P.) and the Société des Participations Pétroliéres (Pétropar) with respect to the country's coastal regions. In the case of the Federation of *Nigeria,* on the other hand, self-government had advanced to such a point in recent years that the granting of minerals concessions had become a purely internal matter, all property in, and control of, all minerals and mineral oils having been vested in the then Colony save in so far as those rights might have been limited by an express grant made before the ordinance in question (Minerals Ordinance of 1946) came into force. In addition, the principal oil companies operating in Nigeria —Shell-BP Petroleum Development Co. of Nigeria, Ltd., and Mobil Exploration Nigeria Ltd.—are incorporated in the country.

END

[8] *Journal officiel de l'Afrique Equatoriale Francaise,* March 15, 1959, as corrected in *Journal officiel,* Gabon, Febr. 15, 1959; *Journal officiel,* Congo, April 15, 1959, as corrected Sept. 15, 1959.

Tidelands Fight Continues

With Louisiana, Mississippi, and Alabama now refusing to accept the Supreme Court's decision of last June as the last word, the tidelands oil fight is expected to explode afresh in Congress.

The three states will seek a reversal of the decision that their offshore boundaries go out only three miles into the Gulf of Mexico while those of Florida and Texas extend out 10½ miles. In the meantime these states are prepared to wage a delaying action against the court's orders designed to carry out the decision. What is at stake for the three contender states is the area between the three-mile and 10½-mile line of the offshore lands. If the Supreme Court decision cannot be reversed, the hundreds of millions of dollars in income from oil leases on these disputed lands will belong to the federal government instead of the states.

Steel Buying Slim

Oil companies, which buy about 5% of all steel rolled, appear to be set to step up purchases—but these will be small, and will come about entirely because steel inventories are running out. The major oil operators see little chance of a first-quarter 1961 speedup in well drilling large enough to bring any strong upswing in steel buying. Continental Oil, in Houston, says it will buy "substantially" more steel in the first quarter than it is taking now, but notes it is because "we have been buying practically nothing."

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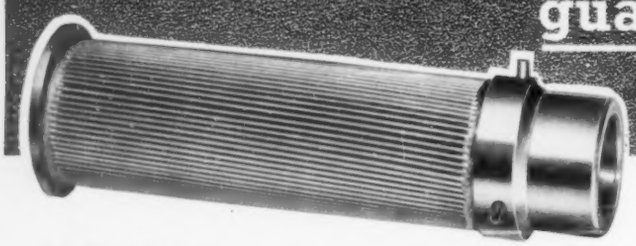

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Vokes now introduce a new all metal filter medium of outstanding efficiency for the *controlled* filtration of hydraulic and lubricating oils, fuels, air, gases, acids, caustics and related caustic materials, chemicals and solvents at extreme temperatures and pressures. Poroloy CM filter elements can be made in any size or shape from a variety of metals—Stainless Steel, Inconel, Nickel, Copper, Steel and Nichrome being the most popular—features which, combined with special production techniques to give controlled pore configuration, enable filters to be individually designed for special applications. Metals can be selected with the particular requirements of the application in mind and the size of the pores can be controlled to deal with particles of between 2 and 250 microns. Poroloy CM filters are therefore 100% effective against a stated particle size, *the danger of media migration being eliminated by an accurately controlled sintering process.* The ultimate tensile strength of the elements varies from 2,000 to 60,000 p.s.i. and the operating temperature range is from —400°F to 1200°F.

The unique combination of properties found in Poroloy CM has led to its recent use in critical temperature conditions in the United States missile and aircraft industries, including installation in the Boeing 707.

POROLOY T.

Similar in performance to Poroloy CM but manufactured by a different process, Poroloy T has an operating temperature range from —400°F to 1500°F. Pore size ratings are from 2 to 250 microns and tensile strength varies from 2,000 to 100,000 p.s.i.

This illustration shows the many sizes and forms—seamless tubes, flat discs, corrugated elements etc.—in which Poroloy can be manufactured.

Both filter elements are manufactured in conditions of micro-cleanliness and before despatch are individually checked for performance in bubble point testing equipment.

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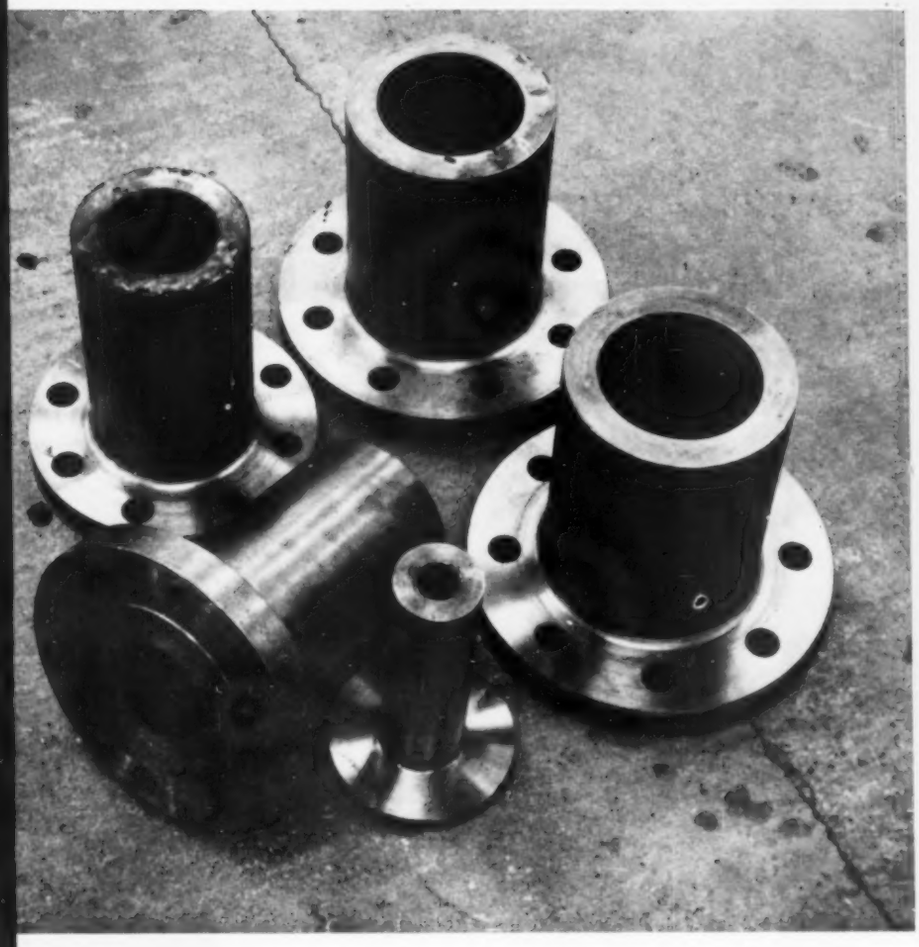

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INTERNATIONAL NEWS AND NOTES

ANGOLA — Crude production for the first nine months in 1960 came to 48,401 metric tons (1,216 b/d). This included (in tons): 68,993 fuel oil, 34,013 gas oil, 19,770 gasoline, 2,523 kerosine, and 213 butane. Crude processed totaled 129,472 tons during the period.

ARGENTINA—Argentina in the first 10 months of 1960 increased its oil output by 37% while cutting its imports 28%, according to YPF, which said crude production in the period totaled 50.3 million bbls, while imports of crude and products were cut to 32.8 million—thus saving $37.5 million in import costs, or 25% under those in 1959.

ARGENTINA—Despite opposition within the country, the Argentine government is courting more private investment in oil. It seeks bids on areas which have been reserved thus far for exploration by YPF, the State oil agency. The federal government "cannot continue making public investments in oil," says President Frondizi, and in this sentiment he is joined by Minister Alsogaray.

AUSTRALIA—Woodside (Lakes Entrance) Oil Co. plans further intensive exploration and drilling in the Gippsland area of Victoria. The company will pay particular reference to development of marine cretaceous sediments. Existence of beds of this age, equating with the petroliferous beds at Port Campbell, Victoria, had been established. The company is planning to hasten drilling in the area.

Geological surveys are planned for the new year in two remaining areas. These are the Clarence and Thallon basins in New South Wales. The company expects to complete surveys in three of five sedimentary basins which it holds. North of Wilcannia, geological field mapping has established the existence of a very large anticline near Mt. Jack station. The structure is about 20 miles in length, is strongly developed and closure has been established.

AUSTRALIA—A measure under consideration in Sydney, NSW, would fine ship owners $2,250 per offense for discharging oil within 150 miles of the Australian coast. Claiming their margin of 10¢ per gallon is insufficient for a fair profit, dealers are seeking an increase in the government's fixed price on gasoline. The Australian Tariff Board has begun an inquiry into existing government duties on oil products and imports. Other organizations are petitioning the board to recommend a reduction in the retail price of gasoline throughout the commonwealth.

AUSTRALIA—Cordillera Mining Co. has entered into an agreement to assign its six-million acre oil and gas concession in Queensland to subsidiaries of Continental Oil Co., Ohio Oil Co. and Amerada Petroleum Corp. Assignment of the concession is subject to the approval of the Queensland government.

Australian affiliates of the three companies will pay Cordillera a cash consideration as reimbursement for acquisition costs and exploration expenditures incurred to date. Cordillera will retain a 25% working interest which will be carried by the oil companies in an exploration program to be conducted by them. Cordillera's working interest will be convertible at its option into a net profits interest of 7½%.

Government approval of the assignment will grant the oil companies exclusive oil and gas exploration rights within the concession area for a period of ten years. Should exploration result in a discovery of oil or gas, the government will lease a one-hundred square mile area around the discovery to the oil companies and a 10% royalty will be payable to the government from production.

Robert P. Creson is president of Cordillera Mining Co.

AUSTRALIA—Union Oil of California is slated to drill a 12,000-ft wildcat, its first Australian test. Through its affiliate Union Development Corp., the California-based company owns a 40% interest in concessions in Queensland and northern New South Wales. Also partners in the venture are Kern County Land Co. (California) and Australian Oil & Gas Ltd.

AUSTRALIA—Australian refiners produced a record 7,360,000 gal of LPGas during 1959—seven times the initial production five years ago. With continuously mounting demand for the fuel, Australia may soon be an LPGas importer.

BOLIVIA—With C-47 well now reported producing 1,380 b/d and C-50 with a present output of 830 b/d, it is believed YPFB (Bolivia's state oil agency) is tapping deeper horizons in the Camiri fields. Up to now, average depth of the field's oil sands has been 4,500 ft.

BOLIVIA—To earn the two-third interest held by Signal Oil & Gas and Sohio in a Bolivian concession, Gulf Oil Corp. will drill a wildcat. Drilling costs will be shared by Pure Oil, which holds the other third of the concession. However, rights held to some 1,145,000 acres additional will be retained by Pure, Signal, and Sohio.

BRAZIL—Brazil's crude imports in the first half of 1960 came to 20,501,072 bbl—more than half of it (12,180,230 bbl) from Venezuela; the remainder from Kuwait, Saudi Arabia, and Peru. Brazil's crude exports in the same period came to 3,234,241 bbl—including 2,734,947 to the Netherlands West Indies, 239,512 to Trinidad, 139,018 to The Netherlands, and 119,764 bbl to the United Kingdom.

BURMA—A new agreement has been reached whereby the Burmese government has promised for the next 15 years not to push for further increases above the 51% share it obtained recently in the Burma Oil Co. (1954) Ltd. In return, the British partners in the joint company will provide 49% of the new $4.8 million capital required to expand the small refinery in Rangoon. The new agreement also calls for a $5.6 million three-exploration expenditure.

CEYLON—Initially, for government military and transport services, Ceylon government plans to import Soviet oil; thereafter to sell the Russian oil in the open market.

CUBA—First major contribution to Cuban relief by a USA corporation is the gift of $100,000 by Texaco Inc. to relief organizations working with refugees from Cuba's Castro regime. President Eisenhower's coordinator for Cuban aid, Tracy S. Voorhees, predicts the oil company's gift will stimulate similar ones from other companies and private individuals. Texaco had operated in Cuba for over 50 years until confiscation last June. Valued at $55 million, the company hopes to get the seized properties back some day.

CUBA—Cuban refugees report that Cuba can keep only two of its three big oil refineries running at any one time. Breakdowns grow with lack of spare parts, the corrosive effect of Russian crude, use of none-too-skilled technicians. Fuel-oil shortages multiply, threatening economic paralysis.

CUBA—Cuba has offered to step up buying from Canada tenfold during 1961 in an effort to obtain goods the USA refuses to sell to the Castro regime, but Cuba says it will not buy USA-made equipment in Canada and the Canadian government says it won't sell the Cubans any strategic materials. During 1959 Canada exported about $12 to $15 million of goods to Cuba, but during the first 10 months of 1960 Canadian exports to Cuba were off about 25%. "Imports from Canada can reach up to $150 million," said Regino Boti, Cuban minister of economics who headed a trade delegation to Ottawa recently. Canadian Trade minister George Hees said he is confident a sharp rise in exports to the Cubans "will materialize."

DENMARK — Denmark's inland oil consumption, which was slightly more than 40,000 b/d in 1954 and somewhat less than 100,000 b/d during 1960, is expected to rise to 140,000 b/d by 1967.

ECUADOR—Vicente Levi Castillo, newly appointed Ecuadorian secretary for mines and hydrocarbons, is inviting private USA oil interests to enter his country in all areas. Though production to date has been small (about 7,700 b/d during 1959), the secretary believes tax, currency, and other economic and political advantages provide a favorable climate for investors.

EGYPT—The Egyptian government's General Petroleum Co. has reported a discovery with 126 b/d initial production, at Rahmi, 30 miles north of the State-owned Ras Bakr and Karim oil fields which went into production earlier this year.

EGYPT—Secretary-general of Suez Canal Authority in Cairo estimated revenues from canal transit tolls would be a record $144.5 million for 1960, and would rise to $175 million in 1961. Total for 1959 was $125 million. Authority chairman Mahmud Yunes attributed rising income to canal's modernization. By January 1961, he said, canal would permit transit of 37-ft-draft vessels and 47,000-ton displacement. Passage has been limited to 35- to 36-ft draft and tonnage up to 38,000 tons.

EGYPT—In contrast with Italy's usual 50-50 partnership offers elsewhere, the Italian government's oil agency ENI reportedly has offered only 30% Egyptian State participation in the Italian's agency's bid for Western Desert oil rights. Pan American International and the Shell-BP affiliate in Egypt are the only others known to have submitted firm offers so far.

EIRE—(Republic of Ireland)—Eire is to have its first wildcat in 1961, according to Ambassador Oil Co. which has a concession over the entire republic and which currently is conducting seismic surveys.

FRANCE—France will cut the gasoline tax by 2.3¢ in 1961 if the oil companies agree to reduce gas prices by 1.5¢ per gal. This would result in a gasoline-price reduction of 3.8¢ per gal.

FRENCH SAHARA—Crude exports from Bougie, Algeria, in the third 1960 quarter totaled 1,855,365 metric tons, all from Hassi Messaoud field via the pipeline completed in 1959. All but two shipments went to France. Another shipment of 135,000 tons was exported from La Skhirra, Tunisia. All this crude came from Edjele fields via the new pipeline.

FRENCH SAHARA—Ste. Nationale des Petroles d'Aquitaine (SNPA) during 1961 expects to open to a 10,000 b/d potential a third Algerian Sahara producing region. The El Gassi-El Agreb area is 75 miles southwest of the large Hassi Messaoud field, and already has completed five producers. SNPA expects four El Agreb wells (No. 2, 6, 7, and 8) to produce about 8,000 b/d—with the remaining 2,000 b/d to come from the area's discovery, El Gassi No. 1. SNPA is the French government-controlled company whose French partners are Coparex, Eurafrep, and Francarep.

FRENCH SAHARA—French authorities in Algeria are expected to grant more permits in 1961. As of September, exploration permits in Algeria covered 60,844 square kilometers, or 20.6% of the surface area of 295,033 sq km. Five new permits were granted in the third quarter of 1960, the first since 1954. Four of these (issued September 27) cover 25,270 sq km—requiring minimum investment the equivalent of $8,265,000 during the initial four-year period. Only foreign country represented in the four is Germany, with Deutsche Schachtbau participating in three of the new permits through its subsidiary Ste. des Petroles des Hautes Plaines.

GABON—The French company SPAFE (in which Mobil holds a one-fourth interest) has made its fourth discovery in Gabon—at Assewe. On initial test, two zones produced 12.5 bbl per hour between 2,670 ft and 2,860 ft. A third zone initially produced 4.7 bbl per hour at 3,720 ft. The well has not as yet been fully evaluated, and drilling continues.

GREAT BRITAIN—Total value of USA direct investment in Britain has grown steadily since 1949, and has more than doubled since 1956. About 25% of the nearly 900 USA companies now operating there made their entry since 1950. About half of the companies are in manufacturing and oil refining, which together account for 85% of the total invest-

ment. Among the five biggest in terms of assets are Standard of New Jersey and Socony Mobil. In 1958-59, British branches of USA manufacturing and petroleum companies earned an average 16%; USA industry as a whole earned about 11%. USA manufacturing and petroleum companies operating in the six-nation European Economic Community also averaged earnings of about 11% on net assets.

GREECE—With expected arrival in Greece of a drilling rig, December 6, 1960, Esso Hellenic Inc. was preparing for its first test on the island of Zakynthos. Drilling was slated to start middle of January 1961.

GREECE—The French government's Regie Autonome des Petroles (operator for French interests in partnership with the privately owned Greek firm Helios) has spudded the joint venture's first test near Orestias in Western Thrace.

GUATEMALA—After two failures, Ohio et al. have decided to make another try at a new site. San Roman No. 1 was abandoned recently because of salt-water encroachment (see *WPR* 11-15-60). The first was abandoned after some oil shows.

INDIA—Standard-Vacuum Oil Co. announced in Bombay that, with "immediate effect," the company had decided to surrender duty protection on all oil products covered by the refinery agreement with the government of India. Duty protection on gasoline had been surrendered three years earlier.

INDIA—India's government has again deferred refining of Assam's shut-in crude—this time until end of 1961—because of delays in construction and shipment of machinery for the 15,000 b/d Romanian-built plant, first of two State refineries to process Assam crude.

INDIA—The Indian Oil Co. has negotiated the sale of diesel oil from the Soviets to Indian State transport agencies. A cargo of 11,000 tons of Russian kerosine has been stored temporarily in facilities of western oil companies in Bombay and Cochin. IOC is proceeding with plans to provide its own storage.

INDIA—Chairman of Mannesmann (German steel firm) said in Bombay recently that his company—with the Italian State oil entity ENI and Italian business interests—had signed a contract for a 1,240-kilometer pipeline to connect Naharkatiya oil fields with proposed refineries in Gauhati (Assam) and Barauni (Bihar).

IRAQ—A new economic and technical-aid pact provides for $33.7 million of Czech credits to assist refining and petrochemical projects in Iraq. Iraq is to repay the credits in eight equal installments.

IRAN—First offshore wildcat by NIOC will be drilled on Shuaib Island, west of Quishm and south and east of the consortium's mainland producing fields. Lying about midway between NIOC's No. 2 Mand and No. 1 Suru tests (near Bandar Abbas at the eastern end of the consortium's operating area), the island offshore wildcat will be drilled with the rig from Suru No. 1.

ITALY—Only major international oil company to show a profit from its Italian operations in 1959 was Mobil Oil, with about $1.4 million. Among these with large losses were Purfina (Petrofina affiliate) with a $2.5 million deficit; Esso with $1.8 million; and Shell with $1.7 million.

ITALY—Italy is now the Free World's leading importer of Soviet oil. It took three million tons (about 60,000 b/d) during 1959, and in the first seven months of 1960 took 2.7 million (about 54,000 b/d) of Russian crude. ENI (Italian State oil agency) has signed a $200 million contract for exchange during 1961-64 of 12 million tons (about 240,000 b/d) of Soviet oil for 240,000 tons of Italian steel tubing and 50,000 tons of synthetic rubber. The exchange of Italian pipe would work out to about $1.00 per bbl for the Russian oil, which compares with about $1.85 per bbl for comparable crude from the Middle East.

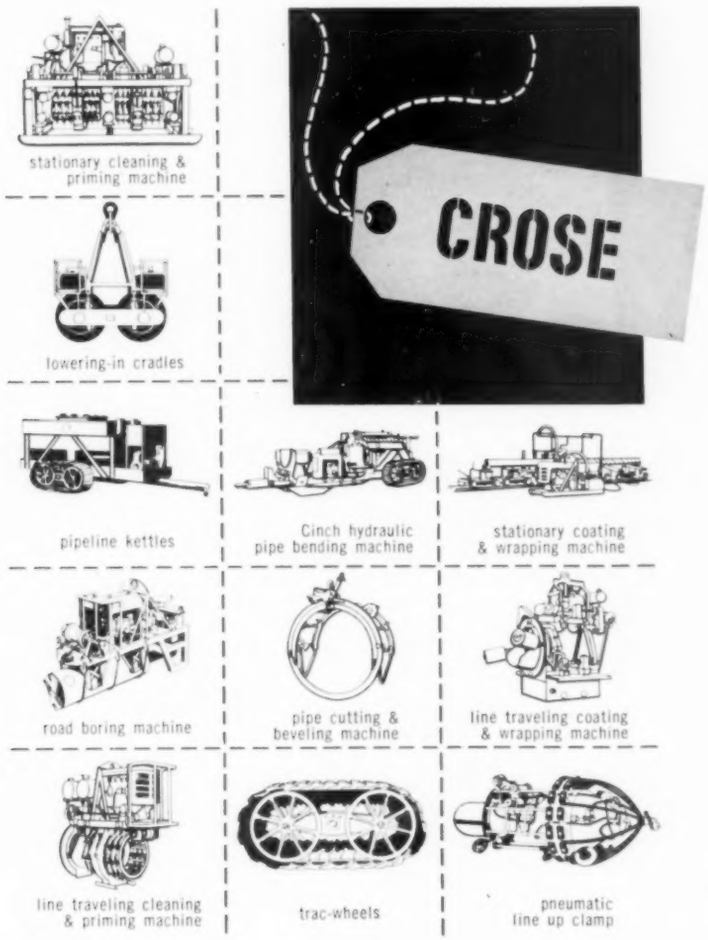
JAPAN—Offshore from the artificial island now being constructed off Niigata prefecture, Teikoku Oil Co. will drill eight wells. The company is spending $833,000 for the island, on which it has discovered a natural-gas field.

JAPAN — Managing director Yoshima Kanno of Arabian Oil Co. (Japanese firm) says his company has almost completed negotiations with several USA banks for $50 million loan to develop the firm's Persian Gulf concessions, the crude from which will be sold to Japan. Unless Japan develops its own sources, Kanno says, it may be forced to import Russian crude.

KUWAIT—In the face of considerable competition, Shell International Co. (subsidiary of the Dutch-Shell group) was awarded a long-term contract over an as yet undisclosed number of acres in the Persian Gulf, the acreage lying beyond the offshore section contained in the concession of Kuwait Oil Co. (owned by Gulf and British Petroleum). Initial bonus payment to Kuwait by Shell is $84 million. The contract calls for 50-50 profits' split—with Kuwait having an option to purchase up to 20% of the operating company.

LEBANON—Cie. Libanaise des Petroles (50% owned by the German firm Elwerath) is to spud its second Lebanese wildcat in southern Lebanon, at Adloun. The company's No. 1 El-Kaa was abandoned dry in the Bekaa valley, northern Lebanon.

LEBANON—Middle East Petroleum Services Ltd. is the name of a new consulting firm to advise on Middle East and North African oil affairs. Registered in Lichtenstein, with headquarters in Beirut, 15% of the new firm is held by the American John Matthew Sladic, until the recent Arab oil congress a technical advisor to Saudi Arabia's department of petroleum and mines—from which post he has resigned. The other 85% is controlled by private Arab interests, which include Contracting & Trading Co. (Emile Bustani) of Beirut. Also participating is former Libyan Premier Mustafa Ben Halim, now also



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International News and Notes

(Continued from page 79)

associated as an oil consultant with former USA ambassador John L. Tappin. Organized with Lebanese, Saudi, Kuwaiti, and Libyan business interests, Iraqis may join later.

LIBYA—The petroleum commission of Libya on November 26, 1960 announced the discovery of a new oil field by Oasis Oil Co. of Libya, Inc. in Concession 59 in Petroleum Zone No. 2, Cyrenaica. This discovery well, A2-59, flowed 35 gravity oil at the rate of 4,440 barrels of oil per day from a depth of 6,600 ft. Preparation for two confirmation wells has already been started to further evaluate this promising discovery. This new discovery is about 15 miles north of the first discovery by Oasis in Concession 59, which was announced March 11, 1960, and is some 35 miles south of the Esso Zelten Field. Oasis Oil Co. of Libya, Inc. is the operator in Libya for a group of three companies, namely, Amerada Petroleum Corp. of Libya, Continental Oil Co. of Libya, and Ohio Oil International of Libya, Inc.

LIBYA—On the fifth anniversary of the start of oil operations in Libya, Esso during December 1960 gave up 25% of its tract No. 1 where noncommercial oil and gas had been encountered, and Hunt International surrendered 25% of its tract No. 2. A number of other relinquishments are expected to follow shortly.

LIBYA—Bringing to a total of eight the number of new oil wells in its important Zelten field, Esso recently completed two new producers: On an initial 10-minute drill-stem test, Zelten No. 9 yielded 50 bbl per hour from a layer between 5,711 ft and 5,716 ft. Zelten No. 10 yielded 40 to 50 bbl per hour from a 50-ft section between 5,734 ft and 5,784 ft. Gas surfaced in 7 min and oil in 12 min. Zelten No. 9 is 1.6 miles east, and No. 10 is 1.9 miles north, of the 17,500 b/d Zelten discovery No. 1.

LIBYA—Oasis Oil Co.'s well A-2, in Block 59 in Cyrenaica's Petroleum Zone No. 2, tested 4,400 b/d of 35-gravity crude from 6,600 ft. About 15 miles north of the Oasis B-1 discovery earlier in 1960, the new producer is about 35 miles south-southeast of Esso Libya's prolific Zelten field. Preparations are under way for two stepouts.

NETHERLANDS — Shell and Standard of New Jersey, joint producers in the Netherlands, have three new commercial natural-gas wells. One is at Delfzijl, the German port of Emden; the other two are at Slochteren. Potential has not as yet been determined.

NEUTRAL ZONE—Japan Tanker Assn. has set $10.60 per ton freight rate for Persian Gulf-to-Japan movements of Arabian Oil Co.'s Saudi Arabia-Kuwait Neutral Zone offshore crude.

NEW ZEALAND—Third deep well by Shell-BP with Todd Oil Services Ltd. was scheduled for late October 1960 spudding on the west coast of North Island at Mangahewa, eight miles south of Waitrara in New Zealand' Taranaki province. Latest reported depth of the second deep well at Mangaone, on the east coast of North Island, is about 4,000 ft.

PAPUA—Australasian Petroleum Co. Pty. has reported the Iehi hole has been deepened 1,178 ft—to 5,790 ft in the Cretaceous; 9½ in. casing was cemented at 5,486 ft. Oil shows have been encountered at two relatively thin sandstone sequences. Flow tests will be required to determine the well's significance.

PAPUA—Oil Search Ltd. contributed more than $2½ million in 1959-60 toward its portion of field activities in Papua.

PERU—First test by Mobil Oil, Zorrillos No. 1, on the Aguaitia concession of Cia. Peruana de Petroleo "El Oriente," was planned for mid-December 1960, about 40 miles northwest of Ganzo Azul in the remote trans-Andean area. To earn a 50% interest, the German firms in "El Oriente" (Elwerath, Wintershall, and DEA) will pay half the well's drilling costs. Mobil, with 25%, will pay the remainder, El Oriente, with 25%, will pay nothing toward the well's cost. A second well, Aguaitia No. 1, will be drilled later, five miles northwest on another structure which may extend into other Mobil acreage.

SAUDI ARABIA—In the Abu Hadriya field (discovered in 1940), Aramco has a third potential producer with completion of No. 6. The new find in the 35-gravity field is 3½ miles west of the discovery well—with oil discovered in the Hadriya zone, the same as in No. 1, Hadriya No. 1 and No. 5 are now shut in; and No. 7 (in the Arab zone) is being drilled 6½ miles southeast of No. 1.

SICILY—Monsanto Chemical Co. is abandoning its 45% portion of an oil and gas drilling concession on 780,000 acres in Sicily after having drilled, since 1956, eight unproductive wells in partnership with Societa Edison SpA of Milan. Monsanto is now liquidating its subsidiaries, Franco Inc. and Sigona Inc., which operated in Sicily (through Monsanto's Lion Oil Division). Monsanto is still in partnership with Societa Edison through the USA chemical company's 40% ownership of Sicedison SpA, Italian chemical producer.

SOUTH WEST AFRICA—Two USA firms recently received exploration grants. Etosha Petroleum (Texas Eastern Transmission, subsidiary) obtained a grant of 90,000 square miles. A large grant, of as yet unspecified size, went to Artnell Exploration Co. (wholly owned subsidiary of Artnell Co., Chicago).

SPANISH SAHARA — Gulf has abandoned, at a shallow-depth basement, its second stratigraphic test in the Spanish Sahara, on its Block No. 10 held with the Spanish firm CEPSA. A third "strat" will be undertaken north of Block No. 10.

SWITZERLAND—Because Venezuela selected as its representative to an OPEC subcommittee meeting in Baghdad late in November Dr. Alfredo Tarre Murzi (Venezuela's permanent delegate to various international bodies in Geneva, Switzerland), speculation has been running high that Geneva will be future headquarters for the Organization of Petroleum Exporting Countries. The international exporting organization was formed in Baghdad in September 1960 by Venezuela and four Middle East oil nations.

SWITZERLAND—The Swiss federal parliament has approved an increase of 7 centimes per liter in the gasoline tax.

TIMOR—Tradewinds Exploration (which owns 40% of a 7,000-square-mile concession held by Timor Oil Ltd. and International Petroleum Corp.) has spudded a test at Matai—the first well to be drilled in Timor in 12 months.

TUNISIA—Paris sources report Italy's State oil entity ENI, under a new agreement, will acquire acreage formerly held in central Tunisia by the French firm SEREPT—north of the acreage which SEREPT still holds jointly with Mobil Oil. Under a former 50-50 arrangement between SEREPT and Mobil Oil in three Tunisian permits covering a combined 15,000 square miles, Mobil has paid SEREPT $10.1 million toward the latter's exploration expenditures during 1951. Mobil is understood also to have assumed all of the 1959 exploration costs as well as three-fourths of the costs in the first half of 1960. Mobil has assumed these obligations to gain an early 50% in the SEREPT-Mobil permit.

TURKEY—Mobil Oil's No. 2 Bulgardag has struck oil in south-central Turkey. A stepout from the 1,200 b/d discovery of last summer, No. 1 Bulgardag, the new well has not as yet been evaluated.

UNITED KINGDOM—The United Kingdom upped by 65% the value of its oil imports from the Soviet Union in the first nine months of 1960. $3.3 million for imports compared with $2 million in the comparable 1959 period—with lube-oil imports accounting for $1.3 million of the 1960 total.

USSR—Soviet oil exports have risen to about 400,000 b/d, about double the volume two years ago, according to New York's international lawyer Arthur H. Dean—with 80% of Finland's oil needs and 27% of Greece's being supplied by the Soviets. Russian oil exports to the Free World are "part and parcel" of the Soviet effort to extend its political influence, a phase of the cold war. SONJ's president Rathbone said Russia's political maneuvering in world oil markets is "a very serious threat" to the industry—charging that Russian price cutting was the "straw that broke the camel's back" in the break in Middle East crude-oil prices last summer. However, lawyer Dean maintains the continuing research and development of operating techniques and product quality of the private oil companies should help the latter to compete against Russian oil.

USSR—On the heels of the 2nd Arab Oil Congress in October in Beirut, Lebanon, the Russians have reduced the price of crude to Japan about 10¢ per bbl, but the Soviets have in mind a crude price increase of 2¢ per bbl for Greece during 1961. The Japanese claim the reduction to them is in line with provisions in the original Japanese-Soviet six-year contract. Current deliveries to Japan are said to be running about 16,000 b/d to 20,000 b/d. The Greek government plans to purchase total 580,000 tons of crude and 183,000 tons of gas oil from the Russians during 1961.

USSR—Soviet Russia has opened its first natural-gas pipeline in the northwestern Urals, a four-mile link from Yarino field to Perm. Crews on the project have started laying a crude line from Kamennolozhsky field to Perm refinery.

VENEZUELA—Average output by Sun Oil Co. for 1960 from Venezuela wells should be well above 30,000 b/d, up from less than 20,000 b/d in 1959, according to the company's president Dunlop; current output is above 40,000 b/d. Sun's Venezuelan operations are on a break-even basis despite 1960 write-off in excess of $6 million from abandonment of certain leases. Sun was experiencing comparatively heavy losses in Venezuela two years ago, when drilling was in its early stages. Due chiefly to discovery of additional oil in Lake Maracaibo, Sun Oil should have an increase for the year 1960 in its total underground reserves of oil and gas liquids. The company reported total owned and controlled reserves of around 819 million barrels at the end of 1959, of which 108 million were credited to its principal drilling area in Lake Maracaibo. Sun also has total natural-gas reserves well in excess of four trillion cubic feet.

VENEZUELA—Mobil Oil Co. de Venezuela has made a long-term sales contract to purchase about 13,000 b/d of Venezuelan crude from Creole Petroleum Corp. SONJ subsidiary. Creole will sell to Mobil 112.5 million bbl of Tia Juana medium crude over a period of 22½ years and Mobil will have the right to purchase up to an additional 1 million bbls of light Tia Juana crude over the same period. Mobil has also agreed to finance and operate the development of part of Creole's undeveloped area in Lake Maracaibo. Mobil will receive 75% of the oil produced, and Creole 25%.

VENEZUELA—The limit of 4% which he set originally for annual increments to Venezuela's crude output is not "rigid," says oil minister Juan Perez Alfonzo—who now maintains his original estimate was for 4% to 6% to sustain the country's economy. This may even exceed 6% "in an emergency," he says.

VENEZUELA—Among sweeping proposals drafted by Venezuela's new finance minister Carrillo Batalla for coping with his country's $560 million deficit in the current fiscal year is a proposed $300 million loan from the USA and $55 million to be received from USA and British oil companies in advance tax payments—with $12 million from iron-ore companies. Earlier in 1960, Venezuela borrowed $200 million from New York banks and received $100 million from the oil companies in advance tax payments. With defeat of former finance minister Mayobre's efforts to devalue the Venezuelan bolivar down to 4.05 to the dollar from 3.35, his successor favors a system of exchange controls to prevent continuing flight of capital from Venezuela. Between the end of 1957 and November 1960, Venezuela's dollar reserves dropped $1,116 million.

YUGOSLAVIA—Soviet Russia supplied about 75% of Yugoslavia's crude imports in the first half of 1960. Total crude imports in the period came to 292,250 metric tons, of which the Soviet Union supplied 216,783, Iraq 50,315, Egypt 11,086, Bulgaria 9,566, and Venezuela 4,500 tons.

Gas Lights Europe's Hopes

(Continued from page 66)

The matter will be even more critical when the large-scale reserves of natural gas in the Sahara and elsewhere have to be brought to Europe. In addition to technical difficulties, there will be the economic problem of disposing of the gas at an acceptable price on the European market. The price on the European side of the Mediterranean will depend on the transport system adopted. Two possibilities are being examined; one is to move the gas in liquid form by methane tanker and the second to carry it across the Mediterranean by pipeline.

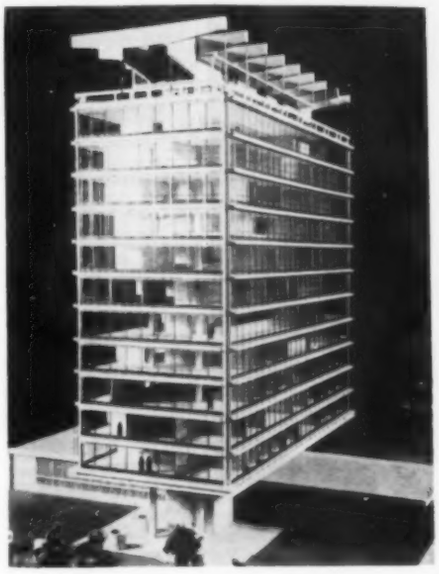
Experience in the use of methane tankers is still too recent to provide any satisfactory figure on which to assess the profitability of the system.

In the case of the pipeline under the Mediterranean, several different routes are under consideration (Gibraltar) Mostagenem, Alicante, and via Sicily); no choice has yet been made, nor is it possible to make an accurate assessment of what it would cost to construct and lay a submarine pipeline, as this would be the first attempt of its kind.

In either case, it can be assumed that the investment required would be considerable.

As gas transportation techniques depend very much on the amount of gas transported, and as costs decrease sharply with the increase in the size and regularity of the flow, great importance must obviously be attached to the preliminary survey of potential markets in Europe for Sahara gas.

The OEEC Gas Committee, in conformity with the wishes of the Energy Advisory Commission, is considering what aspects of natural gas supply, distribution and uses could usefully be studied at international level, bearing in mind that commercial as well as national interests are involved. END



New BP Belgium Building

A new head office building, revolutionary in design, is to be built in Antwerp for BP Belgium, a subsidiary of The British Petroleum Co.

Rising to about 170 ft. in height, the building will have twelve main floors which will literally hang on steel cables. The main support of the building will be provided by a concrete central core formed by two lift shafts. Concrete beams will be cantilevered out from the top of this central core, and from the beams will be suspended the steel cables which will support the floors.

Texas Allowable Up

Texas authorized the state's oil wells to operate on a nine-day basis during December, breaking a string of seven consecutive months in which output levels had been held to a record low of eight days. Independent producers joined major crude buyers in asking for the increase. Texas oil men have been complaining that the state has been bearing the brunt of cutbacks to offset a worldwide oil glut.

Florida Supreme Court Rules

The Florida Supreme Court has handed down a unanimous decision awarding Coastal Petroleum Co., wholly owned subsidiary of Coastal Caribbean Oils, Inc., full rights to all minerals under the company's drilling leases covering approximately 4.5 million acres of Gulf of Mexico water bottoms and a number of inland lakes and rivers.

The State of Florida is an increasingly important mineral producer. In 1959, it sent an estimated $160 million worth of minerals to world markets, or approximately $100 million more than the State produced and marketed in 1950. It now ranks as the second largest producer of titanium minerals and the first in the production of zircon, phosphate rock and a valuable clay known as "fuller's earth," all of which minerals are included in the rights awarded Coastal Petroleum by the Supreme Court decision.

In May 1960, Coastal Caribbean Oils, Inc., through its Coastal Petroleum affiliate, benefited from the United States Supreme Court decision recognizing Florida's title to submerged lands lying a distance of 10 miles from the State's Gulf of Mexico shore lines. Under an operating agreement with The California Co., a Standard of California subsidiary, an oil and gas search is presently underway on Coastal Petroleum's tidelands leases. One test well in this oil search program is drilling at an offshore site some 50 miles due south of Tallahassee.

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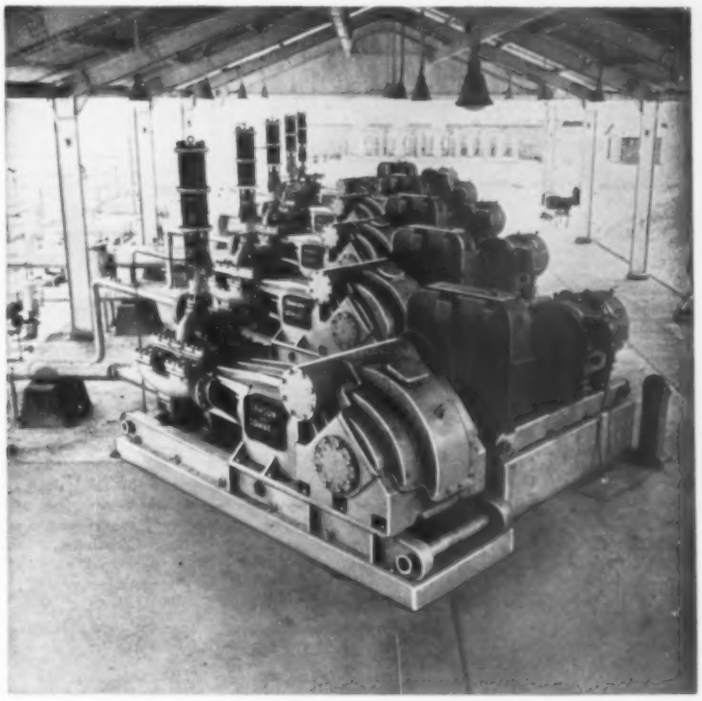

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OIL COMPANY STAFF CHANGES

I. H. Hughes

E. E. Martin

J. A. McQuilkin

H. W. McCobb

IVOR HAYDEN HUGHES has been appointed executive vice president, Pan American International Oil Corp., according to C. F. Dohm, president. At the same time, Mr. Dohm announced that **EDGAR E. MARTIN** has been named genral manager of Pan American International's operating subsidiary in Argentina, replacing Mr. Hughes. Mr. Hughes has been located in Buenos Aires since September, 1958, when Pan American Argentina Oil Co. began exploration and development operations under the contract with Yacimientos Petroliferos Fiscales, the Argentine state oil agency. Mr. Martin comes to his new position from Pauley Petroleum Inc., for whom he was general manager of its Mexican subsidiaries operating under a contract with Petroleos Mexicanos. Prior to joining the Pauley organization in 1951, he had 16 years oil industry experience in the mid-continent and southwest area.

DR. R. W. BRAUCHLI has retired as vice president of exploration and production for Anderson-Prichard Oil Corp.

FRANK E. WILDER, adviser on international labor relations for Mobil International Oil Co., has retired Dec. 31 after 32 years of service.

B. F. STRADLEY has been elected to the new office of financial vice president of Phillips Petroleum Co. Mr. Stradley is a director of the company and a member of the executive committee, and has been with Phillips since 1924. **W. F. MARTIN** was elected treasurer and **R. N. SEARS** was elected secretary of the company, both reporting to the financial vice president.

M. W. CONN has been promoted to manager, sales and development division, of Phillips Petroleum Co.'s international department, with headquarters in New York City. He succeeds **JOHN GETGOOD,** who has resigned to become president of Pacific Petroleums Ltd., partly owned by Phillips. **I. L. COFFMAN** succeeds Mr. Conn as assistant division manager.

FONTAINE MARTIN has been appointed associate general counsel of Mobil International Oil Co. He joined Socony Mobil in 1948 in the office of general counsel, and was transferred to the overseas company in 1956.

HULUSI BERILGEN has been appointed chief petroleum engineer for Mobil Exploration Mediterranean, an affiliate of Socony Mobil Oil Co., Inc., responsible for exploration in Turkey.

Mr. Berilgen, who was born in Turkey, worked for two years in the oil fields of North America, and for eleven years in the Raman-Garzan fields and other parts of Turkey. He is a graduate of the University of California and holds an M.S. degree in petroleum engineering. Mr. Berilgen joined Mobil in 1956.

H. Berilgen

H. H. Bruner

J. A. McQUILKIN, a director of Standard-Vacuum Oil Co. since 1952, has been named a vice president and a member of the executive committee. At the same time it was announced that **H. W. McCOBB,** a vice-president and director of Stanvac, was joining Standard Oil Co. (New Jersey) as regional coordinator for the Asian-African-Australasian areas where Stanvac operates.

JOHN K. McKINLEY has been appointed general manager of Texaco's Petrochemical Department. Mr. McKinley was formerly the manager of commercial development processes in the company's research and technical department at Beacon, New York.

W. H. HELMERICH, chairman of Helmerich & Payne, Inc. has been succeeded as president of the company by **WALTER H. HELMERICH, III,** former executive vice president. Founded by W. H. Helmerich in 1920, Helmerich & Payne, Inc. has grown into a diversified industrial organization with over twenty-three million dollars in assets. Principal operating divisions of the company include oil and gas production, contract drilling, pipeline construction and natural gas odorizing.

MARIS G. FLETCHER has been named director of publications at British-American Oil Producing Co., Dallas, Texas, to succeed Andy Tarvin, who recently joined the Cain Organization of Dallas.

L. CHASE RITTS, Jr., has been appointed coordinator—crude oil production, purchasing, and transportation of Standard Oil Co. (Indiana) at Chicago.

JOHN R. EVANS has been elected vice president for production and a director of Pan American Petroleum Corp. Mr. Evans succeeds the late Whitney M. Elias, who died unexpectedly of a heart attack in Paris, France in September. For the past 18 months, Mr. Evans has been located in Chicago as general manager of production with Standard Oil Co. (Indiana), Pan Am's parent company. Prior to that assignment, however, he had been identified with Pan Am and predecessor companies since 1925.

WALTER WILDS has been appointed manager, Pittsburgh Foreign Section, Treasury Department of the Gulf Oil Corp. He succeeds **J. E. ALLEN,** who is retiring after 30 years of service with the company.

L. E. (LARRY) SCOTT, well known petroleum industry land specialist in offshore exploration and production, and until recently division land suprvisor for Standard of California, has been appointed assistant to the president of Pauley Petroleum Inc., according to announcement by Edwin W. Pauley, company president. Mr. Scott, a native Texan, had been with Standard and subsidiaries since 1948 in land department work in Oklahoma, Pennsylvania, Louisiana, Florida, Georgia and Alabama. He has been in the Los Angeles division since 1955. His principal duties with Pauley will be chief administrative assistant to the president. The company has extensive offshore interests.

HUGH H. BRUNER has been elected president, and chief executive officer of Battenfeld Grease & Oil Corp., Inc. The board indicated Mr. Bruner would be only the third president of the 45-year-old Kansas City corporation. Battenfeld is well known in the petroleum industry as a lubricants manufacturer and in the building industry as a manufacturer of building and maintenance products. Shipments for the organization are national and international.

W. H. Morris

C. T. Allen

C. J. ALLEN, recently elected president of Sinclair Refining Co., and **WILLIAM H. MORRIS,** since 1957 president of Sinclair Oil & Gas Co., have been elected to the Board of Sinclair Oil Corp., the parent company. Mr. Allen, 56, was an administrative vice president of Sinclair Oil Corp. immediately prior to election to his parent post. Mr. Morris, 44, attained distinction in 1953 when, at 37, he was the youngest man ever elected to the presidency of a major pipe line company. He started with the Sinclair organization at the age of 17.

JAMES D. WILLSON has been elected financial vice president of Tidewater Oil Co. Prior to joining Tidewater in 1959 as controller, a position he will retain, Mr. Willson was financial vice president and a director of Norris-Thermador Corp. in Los Angeles. He previously served for five years as controller of the Plaskon Division of Libbey-Owens-Ford Glass Co.

L. J. MAUROVICH has been named superintendent of the El Chaure refinery and terminal of Sinclair Venezuelan Oil Co. at Puerto la Cruz, Venezuela. Mr. Maurovich, who has been assistant refinery superintendent, succeeds **J. J. CONNELLY,** who has retired after more than 40 years in the Sinclair organization.

GEORGE A. SEYMOUR, chief pipe engineer of Mobil International Oil Co.'s producing department has been transferred to Mobil Oil Co. de Venezuela.

IRA. H. CRAM, formerly senior vice president and chairman of the executive committee, Continental Oil Co., will continue as chairman of the executive committee and also will become assistant to the president. World-wide exploration and production policy will continue to be one of Mr. Cram's responsibilities. **A. W. TARKINGTON** will continue as senior vice president and will be located in New York City. Mr. Tarkington's responsibilities will include the direction of foreign, corporate and financial activities. **JOHN G. McLEAN,** formerly vice president-financial and transportation, becomes financial vice president. The new responsibilities of the financial vice president include the direction of the coordinating and planning department. **L. C. PETERS,** vice president-coordination and supply, becomes vice president-transportation and supply.

JOHN W. TIMMINS, special counsel of foreign operations to Sun Oil Co.'s production department since 1956, has retired, bringing to a close a long and colorful career. Mr. Timmins has been a Sun attorney for over 41 years. He served from 1942 to 1956 as division general attorney for the company's Southwest Production Division, with headquarters at Dallas.

In his most recent position of special counsel, he consulted with Sun officials in Philadelphia on overall production department legal problems, especially those pertaining to foreign operations. This work took him to many of the Central and South American nations, as well as to Europe, the Middle East and Pakistan.

L. E. Scott

J. W. Timmins

J. ROBERT ROSS has been appointed accounting manager of Mobil Chemical Co., an operating division of Socony Mobil Oil Co., Inc.

JOEL H. HIRSCH, formerly chief development engineer at Gulf Research & Development Co., Harmarville, Pa., has been appointed director of the newly formed development engineering division.

R. P. ANDERSON

Dr. R. P. Anderson, former secretary of the American Petroleum Institute's Division of Refining and a veteran of more than 20 years service to the oil industry, died November 26 in Chester County Hospital, West Chester, Pa., after a brief illness. He was 73 years old.

NEW PUBLICATIONS

"Advances in Petroleum Chemistry and Refining," in its new, third volume, continues a series of books founded by Kenneth A. Kobe and John J. McKetta, Jr., of the Department of Chemical Engineering of the University of Texas, Austin. It is aimed at providing annually a collection of progress reports by leading authorities on particular subjects so that all technologists within the industry may be kept up-to-date on the progress being made.

In this latest edition, edited by Dr. McKetta, the book is divided once again into five main sections: economics and future trends, unit operations and design, refining processes, petrochemicals, and mechanical equipment.

Among the specific subjects covered by the various chapters are the following: liquid thermal diffusion, fired tube heaters, mechanism of hydrocarbon isomerization, hydrogenation, hydrofluroic acid alkylation of paraffins, hydrocarbon oxidation, acetylene manufacture, sulfur compounds, and cooling tower design.

"Advances in Petroleum Chemistry and Refining, Vol. III," edited by John J. McKetta, Jr., $16.80. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. (1960).

"This Age of Oil" traces the history of the oil industry in Australia in a handsome new, 200-page (large-page size), beautifully illustrated and bound book just published by the Petroleum Information Bureau. It covers the development of the Australian petroleum industry from the time that kerosine ushered in a new age of illumination to the revolution in transport and economic life which followed the advent of the internal combustion engine.

There are particularly interesting chapters on the development of the oil tanker, the war-time organization of the industry, and the search for oil in Australia and Territories since 1900. The book also describes the individual histories of Australia's principal oil marketing companies.

This is a book well worth the reading time of any oil industry man and one that deserves a prominent place in his bookshelves.

"This Age of Oil," published 1960, by Petroleum Information Bureau (Australia), 30/-d per copy. Order direct from the offices of the Bureau, 174, Swanston Street, Melbourne, C.1, Australia.

"Food for America's Future," a new 167-page book produced by the Ethyl Corp. as a public service, tells what has been done, is being done, and will be done to better equip farms and industries to meet the food needs of future generations.

Among the 12 related articles in the book are three by leaders in the petroleum industry: Richard C. McCurdy, president, Shell Chemical Co.; Kenneth S. Adams, chairman, Phillips Petroleum Co.; and Robert E. Wilson, chairman (retired), Standard Oil Co. (Indiana).

The book was conceived and produced by Ethyl to allay some of the concern caused by the USA's unprecedented population explosion. Aware that there were doubts about the nation's food potential, the company went to outstanding authorities in research, soil science, education, petroleum, farm machinery, electric power, agricultural chemicals, economics, food processing, and marketing. These men were asked about the prospects for feeding an estimated population of 245 million in 1975—and even greater numbers in succeeding years.

"Food for America's Future," McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York 36, N. Y. (1960). $3.95.

"Handbook of Chemistry and Physics," has been brought up-to-date for the 42nd time as the one single-source reference in the world covering mathematics, physics, and chemistry in one volume. Used internationally in research, engineering, education, and industry generally, this book is revised continuously and published annually by The Chemical Rubber Co. of Cleveland, Ohio.

Among the revised, expanded, and up-dated data and information are: atomic weights, electronic configuration of the elements, trade names of plastics, analytical reagents, volumetric primary standards, nuclear spins, and many others.

A number of tables of new data have been added in the newest edition, among them: bond lengths between carbon and other elements, sublimation data for organic compounds, miscibility tables for various organic compounds, dissociation constants of organic acids in aqueous solutions, dissociation constants of organic bases in aqueous solutions, surface tension of organic solutes in water, surface tension of organic compounds in organic solvents, and many others of not quite so direct interest to the petroleum technologist.

"Handbook of Chemistry and Physics," 42nd Edition. $12.00 (outside U.S.A. add 50¢). Chemical Rubber Publishing Co., 2310 Superior Avenue, Cleveland 14, Ohio. (1960).

Foreign Subsidiaries Grow

USA industry faces tougher competition in the years ahead from American-owned producers abroad, according to a three-year census by the U. S. Commerce Dept. which counted 2,800 USA companies having direct investments in over 10,000 enterprises producing goods worth $35 billion during 1959. The department's study placed direct USA business investments overseas at the close of 1959 at $29.7 billion, up from $25.3 billion at the end of 1957, and only $11.8 billion in 1950. This increased movement of Yankee companies abroad also adds to the country's gold and dollar problems, according to the study which indicates that in 1957 these investments in foreign enterprises took some $6.2 billion out of the USA economy and brought back from overseas only about $5.1 billion.

F. M. Simpson

J. D. King

Cities Service Consolidates

A program for the consolidation of all petroleum marketing operations of the Cities Service system in the United States has been announced. The action is made possible by the exemption of Cities Service Co., on December 23, 1960, from the Public Utility Holding Company Act of 1935, to which Cities Service had been subject since 1941. Under the marketing program, a single subsidiary company, to be named Cities Service Oil Co., will direct all Cities Service petroleum product sales in the 38 states from the Rocky Mountains to the Atlantic Seaboard, which comprise the Cities Service marketing territory. Product sales formerly were divided among four subsidiaries.

President and chief executive officer of the consolidated marketing company will be F. M. Simpson of New York, who is now president of the Cities Service East Coast marketing subsidiary, Cities Service Oil Co. (Pa.).

John D. King of Chicago, presently vice president of Cities Service Oil Co. (Del.) through which Cities Service petroleum products have been marketed in the Mid-continent area, will be executive vice president of the consolidated company.

John A. Welch, vice president of Arkansas Fuel Oil Corp., will be a vice president of the consolidated company, and will serve as assistant to the president in carrying out the reorganization program.

Turnabout In Gas Prices

U. S. refiners have indicated gasoline prices will remain "surprisingly firm" this winter—a sign of strength because, as fuel oil for the home-heating market is refined from crude, gasoline is also produced and at times has glutted the gas market during the winter off-season. A rise of ½¢ per gal for home heating oil by seven suppliers in the big Mid Continent market reflects rising demand with declining temperature. However, this year "refiners are more concerned with watching their crude runs and making some money out of the gasoline market," claims one marketer, who says "they're not giving away their gasoline as they have at times in the past."

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Humble Reorganizes

Humble Oil & Refining Co. has announced a long-range plan for organization of the consolidated company's operations and for streamlining its management.

Morgan J. Davis, Humble president, said the main feature of the organization plan is the establishment of four operating regions for exploration, production and marketing with their boundaries drawn according to geographic lines.

Each of the newly designated regions, he said, will be headed by a regional vice president assisted by a general manager. Present operating divisions of the company such as Carter, Esso Standard, Humble and Oklahoma-Pate together with their officers and boards of management will cease to exist when the entire new program is completed.

General headquarters for Humble will remain in Houston while regional offices are in New York City for Esso Standard, Eastern Region; in Tulsa for the Central Region; Houston for the Southwest Region; and in New Orleans for the Southeast Region. Territorial separations will be made by dividing the regions into areas and the areas into districts.

In addition to the geographical regions, there also will be three functional divisions, which are a Manufacturing Division, a Marine Division and the Enjay Chemical Co. The Humble Pipe Line Co. will continue to operate as a separate corporation.

F. A. L. Holloway

J. P. Warner

All refineries will be grouped into the Manufacturing Division with offices located in Houston. J. Prince Warner has been designated as vice president and general manager of the Manufacturing Division. Fred A. L. Holloway has been named vice president for manufacturing on the coordinating and planning group in Humble headquarters.

The Marine Division will include the present marine departments of the Esso Standard and Humble Divisions. John D. Rogers has been named general manager of the newly designated division.

Mr. Davis said the new streamlined plan will become effective immediately in principle and will be implemented as rapidly as operations permit. In the meantime, the company will continue operating under its present system of supervision. He said the plan is another step in Humble's task of perfecting its organizational structure, and that some time will be required to mesh the company's continuing operations into the newly approved management blueprint.

The plan calls for some relocation of personnel, but Mr. Davis said that every effort will be made to hold this to a minimum.

The organization announced recently will have no effect on the company's product brand names which are determined by factors other than this realignment.

The Esso Standard, Eastern Region will replace the Esso Standard Division of the company in the Northeast portion of the United States. The region, headed by William W. Bryan as vice president and Alex A. Diffey as general manager, will include the thirteen states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia, and the District of Columbia. The regional office is in New York. The former Ohio Division will become the Ohio Area of Esso Standard, Eastern Region. Marketing in Ohio will be in the name of Humble Oil & Refining Co., Ohio Area.

W. W. Bryan

S. G. Stroud

The Southeast Region is a newly designated one with its regional office in New Orleans. It will embrace part of the former Humble and Carter Division exploration and producing areas and will combine them with the Southern states in which Esso Standard is now marketing. This new division will be headed by Russell H. Venn as vice president and Carl G. Herrington, general manager, and will include the states of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee.

Part of the area that was included in the former Humble Division has been designated as the Southwest Region. With Ray H. Horton, vice president, and James H. Galloway, general manager, in charge, its offices will be located in Houston. The Southwest Region will include Arizona, California, Nevada, New Mexico and Texas. It also will include exploration and production operations in the states of Oregon and Washington; and operations in Hawaii and Alaska will be administered under the Southwest Region.

The remaining territory of the continental United States will be in the Central Region, which will have offices in Tulsa and will be under the direction of John W. Brice, vice president, and Robert O. Goodykoontz, general manager. The Central Region embraces most of the states formerly served by the Carter and Oklahoma-Pate Divisions of Humble.

Boundaries for the regions are drawn almost entirely along state lines for Humble's marketing operations, but there are certain departures from the various state lines insofar as exploration and production operations are concerned. Here, the boundaries of the oil and gas basins were used to avoid splitting basins between two regions.

The new plan calls for operating management to be responsible to Humble's executive committee, which includes the president, Mr. Davis; executive vice presidents C. E. Reistle, Jr., and William Naden; and vice presidents H. W. Ferguson, H. W. Haight and D. W. Ramsey, Jr.

National Supply Moves Export

The National Supply Co. has announced plans to move its export division headquarters from New York City to Houston, Texas. In a letter to customers, A. R. Meyer, vice president, said the Houston export office, opened in 1956, had become the center of most of the division's physical operations.

"The majority of our export shipments, regardless of destination, clear through the port of Houston and the concentration of our export activities there will enable us to provide better customer service," he said. The headquarters move is scheduled for February or March of 1961. A fully-staffed export sales office will be maintained in New York City after that time.

New Cooper-Bessemer Offices

The Cooper-Bessemer Corp.'s New York District office, and the office of the corporation's International Division, have moved to a new location in Manhattan's business district. Their new address will be 548 Fifth Avenue, New York 36, New York. The office suites will occupy the second floor of the Seamen's Bank for Savings building at the corner of Fifth Avenue and West Forty-Fifth Street.

Cameo Appt.

John R. Feeser has been promoted to assistant to the director of North American Sales of Camco, Inc., Houston oil tool firm. Mr. Feeser had been new products engineer at Camco since joining the company in March. He has had extensive oilfield experience in the United States and South America, with a major petroleum company for six years and, immediately before joining Camco, in sales and engineering positions with Brown Oil Tools, Inc. for seven years.

McCullough Appointment

Mr. Stanley G. Stroud has been appointed coordinator-logging for McCullough Tool Co. Mr. Stroud has been with McCullough Tool Co. for 13 years. His previous position was senior research engineer.

International Petroleum Institute Formed

Formation of a voluntary, non-profit organization —the International Petroleum Institute—"to promote international oil understanding and a better dissemination of more complete information relating to the international petroleum industry" has been announced. A spokesman for the founders stated that it appeared "no truly international body now exists to speak for the various companies and countries engaged in inter-continental oil production and trade," and said that "misunderstandings sometimes result from the lack of an easier exchange of public information among all of those interested in the oil industry around the world."

With temporary headquarters established at 527 Madison Avenue in New York City, the organizers of the International Petroleum Institute stated their intent to function at first as a Founder's Committee, "completely independent of any connection with individuals, companies or countries engaged in the international activities of the oil industry, but with full respect for the practices, customs and laws applying to all phases of oil commerce."

The initial purpose of the group is to set up a framework to attract the interest and assistance of international oil people everywhere, with these major objectives stated:

1. To accumulate and disseminate information relating to the international activities of petroleum exploration, producing, refining, transportation and marketing, without reference to individual company or national self-interest or competition.

2. To promote the wider use of petroleum and petroleum products and the application of petroleum to new industries, products and uses—for greater benefit to the people of the world and to the petroleum industry.

3. To provide a body through which all individuals, companies or other petroleum institutions may cooperate with governments in international matters relating to the oil industry.

4. To foster international trade in all petroleum products.

5. To promote the interests of the international petroleum industry in all phases of its activities.

6. To promote the improvement of understanding among its members and all others interested in oil commerce and trade through the continuous study of the arts and sciences relating to the international petroleum industry.

The International Petroleum Institute has been incorporated under the laws of the State of New York.

The Founder's Committee of the IPI issued an invitation to all interested individuals, companies and countries engaged in international oil activities to submit informaton to the IPI, Suite 1506, 527 Madison Ave., New York 22, N. Y. for worldwide distribution and to offer any suggestions as to how the new organization can serve the international petroleum industry. Telephone number in New York is ELdorado 5-4755.

Public relations and advertising for the International Petroleum Institute has been assigned to The Codella Company, New York.

Japanese Microwave Agreement

Approval has been received from the United States and Japanese governments making possible operation of a technological assistance and licensing agreement between Litton International S. A., of Zurich, Switzerland, and Kobe Kogyo Corp. of Kobe, Japan, it has been announced.

The agreement establishes a long-term working relationship in the microwave tube field between Kobe and Litton International. Kobe Kogyo has the right to manufacture tubes with Litton proprietary developments for customers in Japan and several other Asian countries.

In return for an initial disclosure of information Litton International receives an equity position in Kobe Kogyo. The agreement also calls for Litton International to receive a royalty fee with a guaranteed minimum, and distribution rights in the United States and most of the world for tubes manufactured by Kobe Kogyo, except tubes for home amusement type products.

The company did not disclose the percentage of ownership involved in the equity nor the dollar value of the equity or the royalty fee. Litton International is a wholly-owned subsidiary of Litton Industries, Inc., 336 North Foothill Rd., Beverly Hills, Calif.

NY NOMADS Meet

The New York Chapter of NOMADS held its November Meeting in the Palm Terrace of the Roosevelt Hotel. In addition to a large attendance of local guests and NOMADS there was an unusually large turnout of out-of-town guests. Shown are: (Front row left to right) J. M. Foster—Loffland Bros. Drilling Co.; David C. Bianchi—Baker Transworld; Kenneth J. Langley—Buenos Aires, Argentina; M. S. House—Pan American International Oil Co.; D. M. Brown—Aramco, Saudi Arabia; Tom Ashe—Globe Oil Tools Co.; Leo Falcon—Petrogas; Argentina. In the second row, left to right are: John F. Dinda—Creole Petroleum; R. Gaylord—Wagner Morehouse; Los Angeles, Calif.; Raif Erisken—American Iron & Machine Co., Rome, Italy; R. T. Boulter—American Overseas Petroleum Ltd.; Alan Ford—Stoca; Lima, Peru; Abbas Ghaffari-National Iranian Oil Co.; Ralph Williams—Oasis Oil Co. of Libya, Inc.; Jack Gompf—Oasis Oil Co. of Libya, Inc.; Keyvan Naraghi—National Iranian Oil Co. Third row, left to right, shows: R. Opbroek—Bataafse Intl. Petroleum Co.; Fred B. Williams — Kellogg Overseas; Dick Myers — Caltex Service Co.; Harold P. Allen—National Iranian Oil Co.

Union's Sales Up 19%

Sales of natural gas by Union Oil Co. of California in 1960 will be 35% higher than those of 1959 and comparable increases are anticipated for 1961, Reese H. Taylor, chairman of the board, told members of the San Francisco Security Analysts. "Union's earnings for the year are expected to exceed those of 1959 as profits for the first nine months were 19% higher than for the comparable period a year ago," Mr. Taylor said. "The general improvement in our profit picture reflects the return on capital expenditures during the past several years. This year our capital expenditures will approximate 105 million dollars, compared with 90 million in 1959. Capital expenditures for 1961 will be about the same as for this year."

"Union Oil's gas reserves during the past 20 years have grown more than twice as fast as the industry," Mr. Taylor said. "At the end of 1959 we had reserves of 3½ trillion cubic feet. By the end of 1960 we expect to have reserves in excess of 4 trillion cubic feet. Union's gas reserves on a current value basis are the equivalent of 270 million barrels of oil, one half as much as our present liquid hydrocarbon reserves.

Standard Sponsors "Shakespeare"

Standard Oil Co. (New Jersey) beginning January 10 will present a new 15-week series of Shakespearean drama on television in the New York and Washington metropolitan areas. The program, "An Age of Kings," wil trace 86 years of English history of the Middle Ages and the turbulent reigns of seven rulers through Shakespeare's dramatizations.

"Jersey Standard anticipates with enthusiasm this opportunity for public service in bringing to viewers' homes some of the greatest works of Shakespeare," said M. J. Rathbone, president of Jersey Standard.

"This will be the first time a commercial sponsor has undertaken a Shakespearean series on television.

"Our purpose in sponsoring Shakespeare's drama on televison is identical with our aim in underwriting 'The Play of the Week' last season. That was a desire to gain recognition for our company by helping to make available intelligent, cultural programs on television.

"Careful production and scheduling of commercials to maintain the highest level of good taste continues to be our policy," Mr. Rathbone said. "Commercial messages will be primarily of institutional nature dealing with company activities," he added.

USA Crude Production Down

Domestic crude production in the first nine months of 1960 averaged 7,017,000 b/d, a drop of 0.6% from the like 1959 period, according to API President Porter. Crude-oil stocks as of September 30 stood at their lowest point in 12 years. Producers have completed about 400 fewer oil and gas wells per month than a year ago, according to the API head.

Gulf To Raise Domestic Output

Gulf Oil Corp. plans to increase its domestic crude production in 1961 to 40,000 b/d from 328,000 b/d in 1960 and 230,000 b/d in 1959, according to Gulf's president E. D. Brockett. Though his company is feeling the pressure of Russian price cutting at many points around the world, Mr. Brockett inserts a note of optimism about the oil industry's outlook—saying he believes "there have been more gloomy predictions than the situation warrants."

Gas Storage Gaining

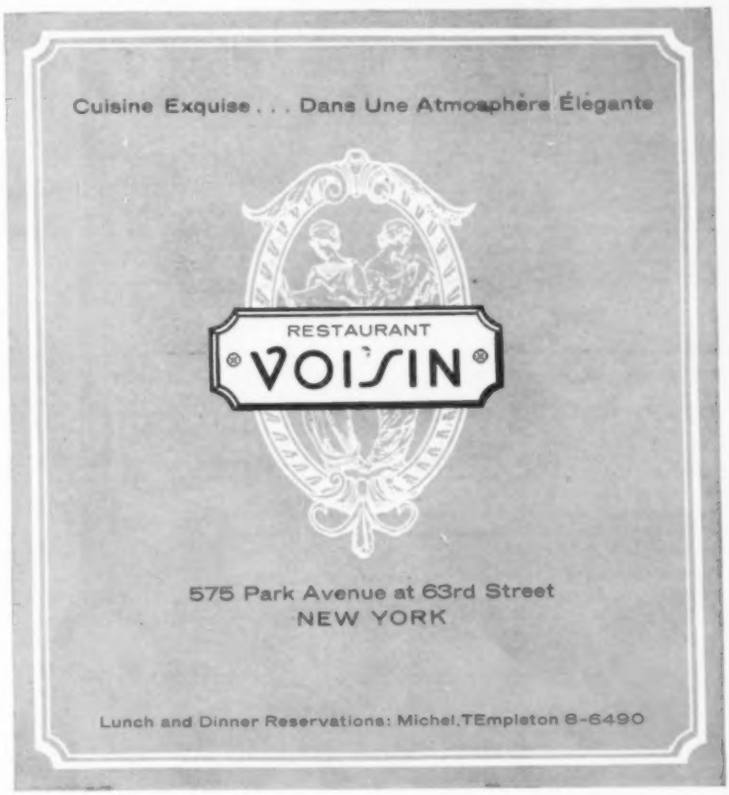
Underground natural-gas storage pools (mostly old depleted gas or oil wells) in the vicinity of large consuming centers have been growing rapidly. In the slack summer season, 209 such pools in 20 states —with a storage capacity of 2,521 trillion cubic feet at the end of 1959—have been fed by pipeline from the Southwest in preparation for the heavy winter gas-consuming period. In 1959, maximum withdrawal from underground gas-storage pools was 11.3 billion cubic feet per day, or 14.7% over 1958. Of this total, almost three billion cubic feet alone could be drawn from Pennsylvania storage pools to meet the heavy gas demand of a single day on the eastern seaboard.

Drilling to Continue Low

The relatively small rate of demand growth in 1961 over 1960 (about 2% to 2½%) is not likely to provide sufficient incentive for an increase in the currently depressed rate of domestic oil-well drilling activity, said SONJ President Rathbone, who predicts the industry will drill about an equal number of wells in 1961 as in 1960. Present indication is the industry will drill only about 44,000 wells during 1960, down from 50,924 in 1959.

Aramco Safety Record

Paul Jones, left, director of public relations for the National Safety Council, talks safety with two employees at the Arabian American Oil Co.'s headquarters in Dhahran, Saudi Arabia. N. A. Scardino, right, is district manager of Dhahran, and Shalhoob Fadgoosh is a gate controlman with the company. Aramco's accident-prevention efforts in 1959 produced the record low rate of only 1.9 disabling injuries for each million hours worked by company employees.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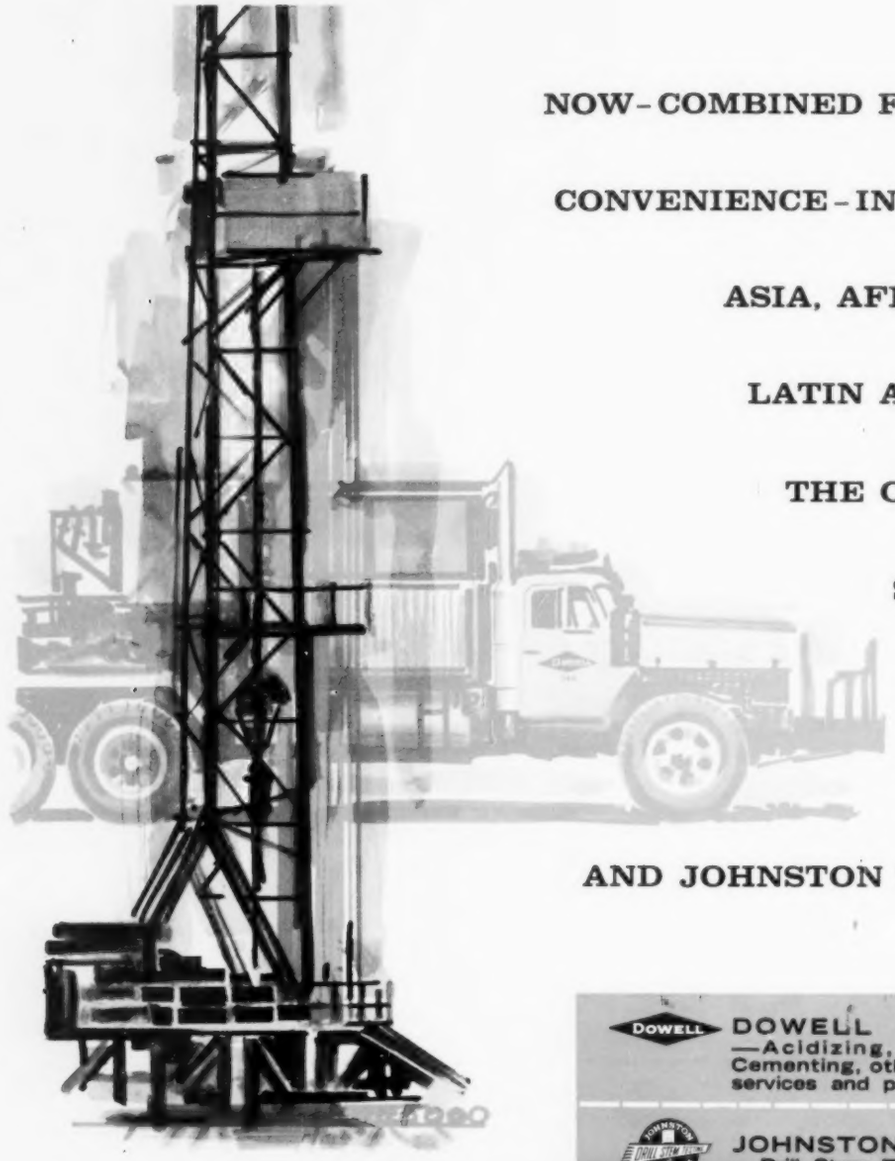

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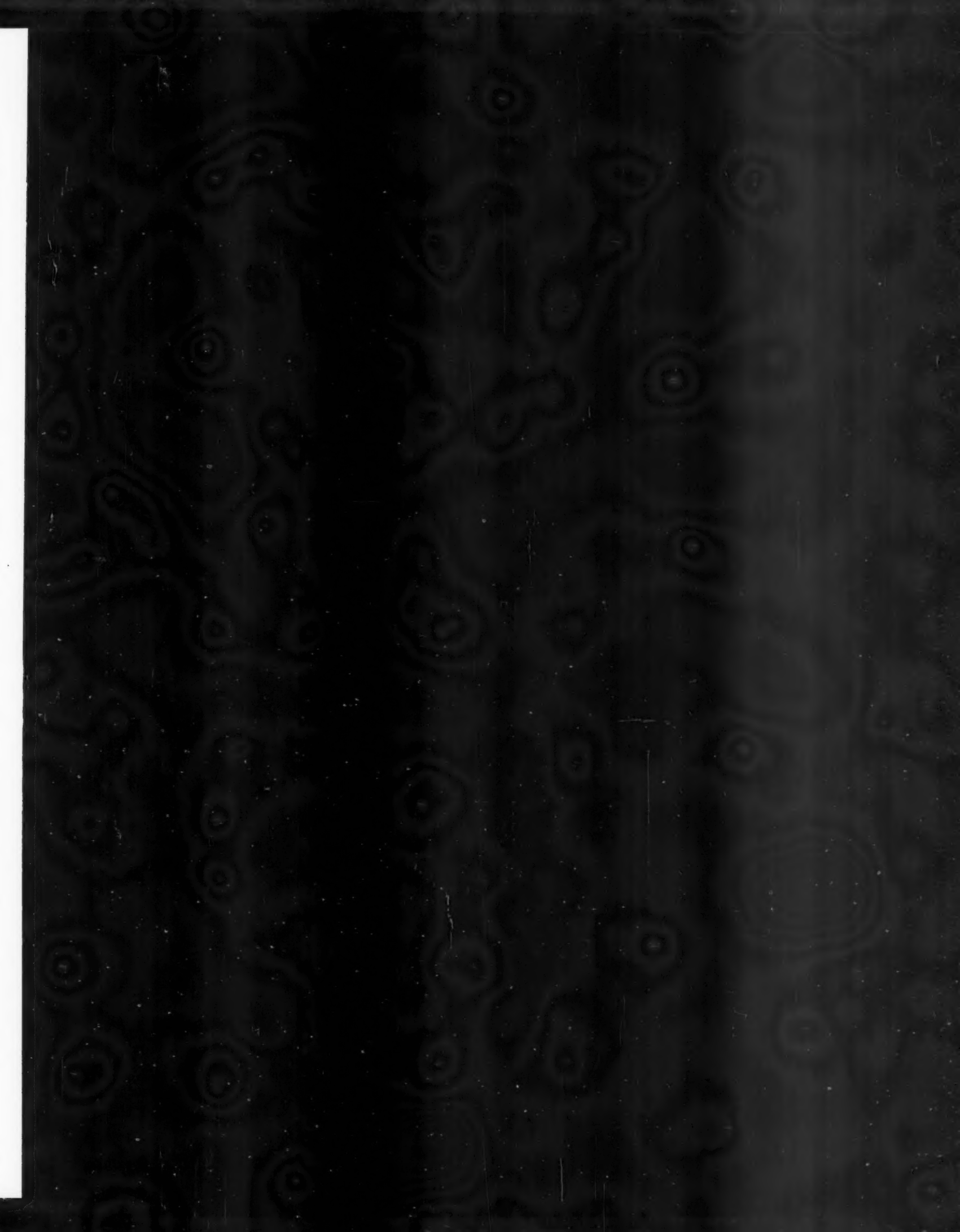
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